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WILDLIFE IN NORTH CAROLINA

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JANUARY 1979

Biennial Report Issue

(July 1, 1976 — June 30, 1978)

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State of North Carolina

Wildlife Resources Commission

RALEIGH, N. C. 27611

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V. E. WILSON, III, *Rocky Mount*

His Excellency, The Governor of North Carolina
General Members of the General Assembly
Raleigh, North Carolina 27611

Dear Sirs:

I am pleased to present to you the Wildlife Resources Commission's 16th Biennial Report for the period July 1, 1976, to June 30, 1978. The Commission's activities and accomplishments during this two-year period are reflected in this report. It is our hope that these efforts have effectively served the rich heritage of the wildlife resources of this State and the more than half million licensed sportsmen as well as the other outdoor enthusiasts who use, enjoy and take care of these resources.

The 1947 General Assembly established the Wildlife Resources Commission with its declared purpose being: "...to manage, restore, develop, cultivate, conserve, protect, and regulate the wildlife resources of the State of North Carolina and to administer the laws relating to game, game and freshwater fishes, and other wildlife resources enacted by the General Assembly to the end that there may be provided a sound, constructive, comprehensive, continuing, and economical game, game fish and wildlife program..." We pledge to you our continuing dedication to this purpose as we acknowledge with deep gratitude your interest and support of our program.

We welcome your advice and suggestions, and by working together, we feel confident that we can meet the challenges of the future.

Respectfully yours,

J. Robert Gordon

J. Robert Gordon

WILDLIFE IN NORTH CAROLINA

The official publication of the North Carolina Wildlife Resources Commission, Raleigh 27611. A monthly magazine devoted to the protection and restoration of our wildlife resources and to the improvement of hunting and fishing in North Carolina.

Volume 43, No. 1 *January, 1979*

State of North Carolina
James B. Hunt, Jr., Governor

Department of
Natural Resources and
Community Development

Howard N. Lee, Secretary

North Carolina Wildlife Resources Commission

J. Robert Gordon, Chairman, Laurinburg
V.E. "Pete" Wilson, III, Vice-Chairman, Rocky Mount
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Eddie Bridges, Greensboro
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Polie Q. Cloninger, Jr., Dallas
Roy A. Huneycutt, Locust
Henry E. Moore, Jr., Clinton
Lee L. Powers, Lake Lure
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W. Stanford White, Manns Harbor

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Donald E. Curtis, Enforcement
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Front Cover *By Ken Taylor*
George Emory, Norman Matthews and Duke are ready for Mr. Bobwhite, and this looks like just the place for a big covey.

Back Cover *By Ken Taylor*

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Your Wildlife Commission

Greater public involvement is a high priority goal for the 13 members of the Wildlife Commission and the professional staff.

How do you keep a government agency responsive to the people while at the same time allowing professionals to manage wildlife resources properly?

This was the dilemma facing the State in 1947, when the North Carolina Wildlife Resources Commission was formed. The basic framework established at that time has functioned well to this day.

Luther Partin

During the biennium, the N. C. Wildlife Resources Commission conducted many hearings and public meetings. Here, Assistant Director Dick Hamilton gathers comments from sportsmen at a public hearing in Edenton on proposed hunting regulations.

The Commission's professional staff is composed of five different divisions: Enforcement, Inland Fisheries, Game, Boating and Information & Education. Within these divisions are the biologists, technicians, wildlife enforcement officers, educational representatives, secretaries and others who keep the agency running on a day-to-day basis with the executive director leading the entire staff.

The board of Commissioners, also known as the Wildlife Commission, sets policy for the agency. This board is composed of 13 individuals. There is one commissioner from each of the nine districts in the State and four additional commissioners-at-large. The district commissioners are nominated in a series of special meetings in their home districts and the Governor appoints one of the top five vote-getters from each such district meetings. Two of the commissioners-at-large are appointed by the Governor, one is appointed by the Lieutenant Governor and one by the Speaker of the House of Representatives. Before the reorganization by the Legislature in 1977, the Commission was composed solely of one commissioner from each district. The district commissioners serve six-year terms and three of them are replaced every two years.

Commissioners receive no salary for their efforts and receive only a small expense account. This expense account rarely covers actual expenses. Commissioners are not regular employees of the State although the hours they put in on the job would often justify this; and at times, it is a thankless job.

The reorganization of the Commission two years ago was done for several reasons and has had several beneficial effects. The addition of four extra commissioners provides greater access for sportsmen to the Commission, and appointees by the Speaker of the House and the Lieutenant Governor also gives the Commission a direct link to the Legislature. These changes give the Commission a voice in the Legislature and also give the Legislature a better understanding of the Wildlife Commission, its needs and its day-to-day problems.

The Commission is required to meet at least two times per year but usually holds regular monthly meetings where policy is set and regulations adopted usually based on the recommendations of the Commission's professional staff. Of the approximately 22 meetings held during the biennium, most were held in Raleigh although occasionally they were held elsewhere in the State.

To give the public an opportunity to participate in the decision-making process, numerous public hearings were also held across the State. These public input gathering sessions are a vital part of the Commission's program. This year, there were public hearings held in all nine districts of the State on the proposed hunting and trapping regulations. There were several commissioners present at each hearing and Commission Chairman Bob Gordon attended all nine meetings. There were also eight hearings held on proposed either-sex deer seasons, three hearings on proposed

J. Robert Gordon of Laurinburg is a Commissioner-At-Large and is also the chairman of the Commission. He is married, has two children and is an attorney. Mr. Gordon was born and raised in Hamlet.

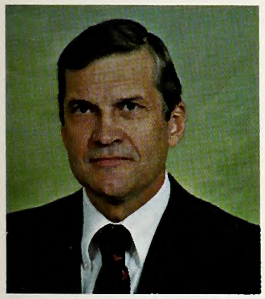
"I'm a serious quail hunter, and I also like hunting waterfowl and deer," Gordon says. "I also enjoy fresh-water fishing and outdoor photography."

In Gordon's opinion, one of the greatest needs facing North Carolina's wildlife today is the need for sportsmen to work together for the benefit of all of the State's wildlife resources and not for individual, special interests.

V.E. Wilson, III of Rocky Mount is the Commissioner from District 3, and is currently serving as Vice-Chairman of the Commission. He is a native of Asheville, is married, has three children and is a sales representative for a pharmaceutical company.

"I enjoy bird hunting, bass fishing and deer hunting mostly," Wilson says, "although I do like almost all types of hunting and fishing."

The biggest problem he sees is uncontrolled industrial development. "We've reached the point in some areas where further development adds to already serious pollution problems and the destruction of limited wildlife habitat," he says.



Dewey W. Wells of Elizabeth City is the Commissioner from District 1. He is married, has five children, grew up in Henderson, and is an attorney.

"I especially enjoy mountain trout fishing, quail hunting, and occasional trips to Maine to hunt grouse," he says. "I also like most any other outdoor sport."

The biggest problem he sees facing North Carolina's wildlife is the loss of suitable habitat for game and fish.

Eddie C. Bridges of Greensboro is the Commissioner from District 5. He is married, has three children, and is a native of Morganton and Burke County. He owns and operates the Carolina Athletic and Supply Company.

"I like to hunt waterfowl and doves, and fish for bass and bream in particular," he says. "Mostly, I like to do a little bit of everything in the outdoors."

The biggest problem he sees facing North Carolina today is uncontrolled, rapid growth which has caused destruction to wildlife habitat. He feels the Commission should have the authority to properly manage wildlife, and feels a revision of the game laws is needed. He also feels that more harmony is needed between various factions of sportsmen.

Wallace E. Case of Hendersonville is the Commissioner from District 9. He is general manager of Case Farm Services and is also involved in real estate development. He is married, has four children and is a native of Hendersonville.

"I like to hunt and fish for most everything," Case says. "I especially enjoy bass and trout fishing and deer and small game hunting."

The biggest problem Case sees facing North Carolina's wildlife today is political management of wildlife. He feels the Commission should have full authority to manage wildlife and to set wildlife laws without outside influence.

Your Wildlife Commission

Roy A. Huneycutt of Locust is the Commissioner from District 6. He is married, has three children and has been in the lumber business since 1936. He is a native of Stanly.

"My first love is quail hunting, but I also like deer and small game hunting, plus bream and bass fishing," says Huneycutt.

The biggest problem Huneycutt sees facing North Carolina's wildlife today is funding for wildlife programs. He feels the sportsman is carrying more than his share of the financial burden for wildlife protection and management.

Edward Renfrow of Smithfield is a State Senator and represents the Senate as a Wildlife Commissioner-At-Large. He is married, has two daughters and is a native of Johnston County. He is also an accountant and farmer raising tobacco, corn and hogs.

"I like to bird hunt, and fish for bream and bass mostly," says Renfrow.

The biggest problems he sees facing North Carolina's wildlife today are the need for the revision of game laws and jealousy between various factions of sportsmen.

M. Woodrow Price of Gloucester is the Commissioner from District 2. He is married, has four children and is a native of Elizabeth City. Before retiring, he worked for 42 years as a newspaperman in North Carolina. For 15 years of his career, he was managing editor of the *Raleigh News and Observer* and wrote an outdoor column for that paper for 28 years.

"I enjoy hunting, fishing and boating," he says. "Most of the fishing I do now is in salt water since I live on the coast, but I enjoy all types of fishing. I also like small game hunting and waterfowl hunting, and I do some deer hunting."

The biggest problem he sees facing North Carolina's wildlife today is division among sportsmen.

Lee L. Powers of Lake Lure is Commissioner from District 8. He is married, has two daughters, is a native of Tennessee and has lived at Lake Lure since 1933. While his vocation was building construction, other business interests have included real estate, land development and management of the Bottomless Pools.

"I like most outdoor activities such as hunting, fishing, boating and golf," says Powers.

The biggest problems he sees facing North Carolina's wildlife today are inflation, the increasing costs of environmental controls and changes in state legislation to provide our Commission with the authority to direct all phases of wildlife resources in an impartial manner.

fishing regulations and nine hearings on the proposed waterfowl regulations. Sportsman input was obtained at each of the meetings, and when appropriate, changes were adopted in the regulations based on suggestions made by sportsmen.

In addition to attending numerous hearings, commissioners often attend meetings held by various conservation organizations throughout the State.

The commissioners also serve on committees dealing with various aspects of the wildlife program. These committees cover areas of law enforcement, boating, information and education, fisheries and game, budget and finance, and legislative matters. The committees work closely with division chiefs and biologists to come up with the recommendations acted upon in the Commission meetings. Between serving on committees, traveling to public hearings, and dealing with sportsmen in their home districts, commissioners put in a tremendous amount of time and work, yet often receive little credit for their endeavors.

During the past biennium, the Wildlife commissioners spent considerable time examining the current status of the agency, assessing the State's wildlife needs and establishing program priorities and directions. The process began with a thorough study of all aspects of the program, then a series of nine statewide meetings

Henry E. Moore Jr., of Clinton is the Commissioner from District 4. He is a native of Clinton, is married, has two children and owns an aerial application service.

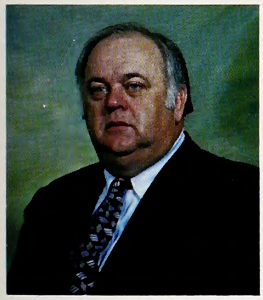
"I like to hunt and fish for most everything, but I especially enjoy deer hunting," he says.

The biggest problems he sees facing North Carolina's wildlife today are destruction of habitat and jealousy between sportsmen.

William C. Boyd of Kernersville is the Commissioner from District 7. He has two children and is a self-employed general contractor. He is a native of Maumee, Ohio, but has lived in North Carolina since 1955, principally in the Kernersville and Winston-Salem areas.

"I'm an avid hunter, fisherman and trapper," Boyd says. "I also raise wildlife as a hobby and love sports in general. I like to follow pro hockey and football, and I played pro hockey for a farm team of the Boston Bruins for a while."

The biggest problem he sees facing North Carolina's wildlife today is the political management of wildlife. He feels the Commission should be allowed to manage wildlife on a professional basis and should not be limited by conflicting local laws.



Polie Q. Cloninger Jr., of Dallas is a Commissioner-At-Large. He is married, has three children, is a native of Stanly and is in the fabric business.

"My main outdoor interests are hunting and fishing in general," says Cloninger, "but I especially enjoy rabbit hunting and crappie fishing."

The main problems he sees facing North Carolina's wildlife today are financing the wildlife program, getting a Game Law revision through, and getting more public involvement in wildlife and natural resources management.

W. Stanford White of Manns Harbor is a member of the State House of Representatives and represents the House as a Commissioner-At-Large. He is married and has three children. He owns a grocery store, marina and several other small businesses in Manns Harbor. He was a wildlife protector for the North Carolina Wildlife Resources Commission from 1949 to 1959.

"My main interest in the outdoors is wildlife," says White. "I like outdoor sports, particularly fishing and boating, and believe in the management and the regulated harvest of wildlife."

"The biggest problem facing wildlife in North Carolina is the need to educate the people about the wildlife program and about wildlife conservation," says White.

to gather public input and resulted in the defining and adopting of a set of agency goals and objectives.

Primarily these goals and objectives are directed toward the resolution of various problems currently confronting the agency as well as problems which will face North Carolina's wildlife in the future.

The agency's information and education program was expanded, updated and revitalized to help improve communications with the State's citizenry as well as to help create a better understanding for and appreciation of agency programs. Work began to resolve problems being created by the current outdated and confusing set of game laws. Cost cutting and revenue generating measures were developed and implemented where possible to help lessen the increasing problem of budgetary limitations. Great strides have been taken to ensure that public input is solicited and utilized whenever possible. Other future problems which must be dealt with include the accelerating incidence of wildlife habitat loss, the poor public image being created by a segment of the sporting public, and the continued problem of limited personnel and financial resources.

The problems facing the Commission are not easy ones. But if a hard working and dedicated board of commissioners is one of the prerequisites, there is room for hope.

Division of Information and Education

Education and an informed public are keys to a sound, balanced environment and a future for wildlife programs.

From the inception of the Commission in 1948, it was understood that a well-rounded wildlife program must include an ongoing educational effort; and for this reason, the Division of Education was created and assigned the responsibility of administering such a program. During the early days the division consisted of only three staff members — a chief, a clerk-stenographer and a clerk-typist. Their primary job was the production of the then bimonthly WILDLIFE IN NORTH CAROLINA magazine. Other activities of the early division included the production and distribution of hunting and fishing regulation booklets and news releases, the distribution of six other miscellaneous publications and fourteen wildlife oriented movies, the presentation of talks, the preparation of several fair exhibits and work with various educational groups.

By the end of the 1948-50 biennium, the Education Division staff had been expanded to a total of eight people. With this full staffing came the capability to accomplish much more, and the production of a weekly radio program, a motion picture and educational posters began. These approaches continued; and during these years, a small staff with a small budget accomplished a great deal. One of their major accomplishments was that, in 1956, WILDLIFE IN NORTH CAROLINA magazine won a national award for being the best conservation magazine of its kind in America.

As time passed, the ever-widening gap between what the division staff could actually do to properly inform and educate the public in the area of wildlife and natural resource conservation and what really needed to be done in this area became more and more apparent. Also, as society became more urbanized, the need for better informational and educational programs became accentuated.

With these points in mind, the Commission authorized and initiated the first expansion of its educational programs during the biennium ending June 30, 1978. Along with this expansion, which included six new positions and brought the division staff size to fourteen, came the change to redefine, reorganize, revitalize and reemphasize the total division program. As in the past, it was to be understood that no one division can completely shoulder the responsibility for carrying out such a program and that every Commission employee has an inherent responsibility to be an information and education vehicle for sound conservation principles.

The first obvious change was that the division became the Division of Information and Education, a name which more clearly states the total division function. Personnel were organized into a Publications Section, an Audio-Visual Section and a Field Section, and the division objectives were defined and formalized as follows:

1. To coordinate and support an education program which will make people more aware of problems associated with wildlife conservation and boating safety and which will apprise them of opportunities to become more actively involved in the solution of these problems;
2. To coordinate and support the informing of people about the need for, and activities associated with, all phases of those programs operated under the auspices of the Commission.

PUBLICATIONS SECTION Responsibilities of this section include the publication of WILDLIFE IN NORTH CAROLINA magazine, "Wildlife Newsletter," "Wildlifer" and various written news media releases as well as the production and updating of various publications, pamphlets and brochures for distribution to the public and the design and layout of the annual hunting, trapping and fishing regulations digests. Two positions, an art director and a staff writer/photographer, were added to this section during the biennium.

These additional positions greatly facilitated the revitalization of the agency's printed materials. Perhaps the most obvious changes resulted in the area of the production of WILDLIFE IN NORTH CAROLINA magazine. The magazine was completely redesigned with what appears to have been a well accepted result.

Ken Taylor

Information and Education Division personnel plan publicity for major events well in advance. Field Coordinator Luther Partin (left) discusses an upcoming issue of the "Wildlife Newsletter" with Tom Taylor (center) and Jim Dean (right).

Ken Taylor

Bruce Craven shoots footage for an upcoming movie on the activities of the Wildlife Commission (above). Pam Dameron (right) assists in the layout of an issue of WILDLIFE IN NORTH CAROLINA magazine.

Ken Taylor

Division of Information and Education

As in the past, primary emphasis continues to concentrate on content; however, more emphasis can now be placed on graphic design, layout, quality of artwork and color.

While, during the early part of the report period, the magazine circulation declined, this trend was reversed, and the circulation increased to around 56,000 subscribers by the end of the biennium.

As a result of program analysis which included input from the news media, the weekly column "Wildlife Afield" was discontinued and the news bulletin "Wildlife Newsletter" became a bimonthly rather than monthly publication. The in-house newsletter, "Wildlifer," was also redesigned.

AUDIO-VISUAL SECTION Two additional positions were also added in this section. A professional still photographer was employed to direct all aspects of the division's still photographic program and a cinematographer was employed to assist with the production of motion pictures. To support these positions, more modern photographic and editing equipment was purchased and assigned. Also, work began to sort and reorganize the agency's archives of motion picture footage and still negatives, prints and color slides.

Ken Taylor

Displays are part of the Information and Education Division's ongoing program. This booth was set up at Winston-Salem to provide information on various Wildlife Commission programs.

Work began on a major motion picture designed to portray the role of the sportsman and the Commission in identifying and resolving those problems which currently face the State's wildlife resources. This project will continue into the next biennium. Several film spots and news clips also were produced.

FIELD SECTION For the first time, a field staff of three regional information and education representatives was created. One of these positions was created by expansion and the other two were transferred from the Raleigh office. A new position was also created to coordinate field activities.

While these personnel also provide articles and photographs for WILDLIFE IN NORTH CAROLINA magazine, their primary function is to coordinate the total information and education field effort of the Commission. Much work was accomplished in establishing and furthering sound relationships with radio, television and newspaper news people as well as with professional educators in many various positions across the State. The results of this was noted by increased news coverage and by the increased number of requests for educational support.

Work also began on the development of a structured environmental education course which can be used to show the vital nature of the State's natural resources and the relationship that wildlife resources have within the environment.

If this course comes to fruition, section personnel will workshop professional teachers within the school systems of the State and provide them with background and supporting literature to be used in classroom situations.

Requests for informational and educational literature, films and extension activities greatly accelerated during the report period.

CONCLUSION In conclusion, the biennium was marked by the greatest changes and improvements in the area of the Commission's information and education program that have occurred in the history of the agency. The primary reason for these advancements can be attributed to the increased awareness of the need as well as the good support of the Commissioners, the Director's office and the other agency personnel. In addition, the physical expansion of the division provided a framework for accomplishment.

While advancements were made during the biennium, much work remains undone. Still, too few people understand and appreciate the Wildlife Resources Commission and the necessity for the conserving of those resources under its purview. Too few people possess the type of total conservation ethic necessary to ensure the perpetuation of a quality life. During future bienniums, current division plans call for continued improvements in all program areas, but especially in those areas involving WILDLIFE IN NORTH CAROLINA magazine and a structured environmental education course.

Division of Game

Game populations grow and spread in North Carolina with the help of new research and management techniques.

During the latter part of the 19th century, wildlife numbers over much of the United States declined rapidly due to the advent of man's capability to alter his environment on a grand scale. In "A Sand County Almanac" Aldo Leopold reminds us that in 1873 the Chicago Trade purchased 600,000 prairie chickens for public market at $3.25 per dozen. The art of game management was nonexistent.

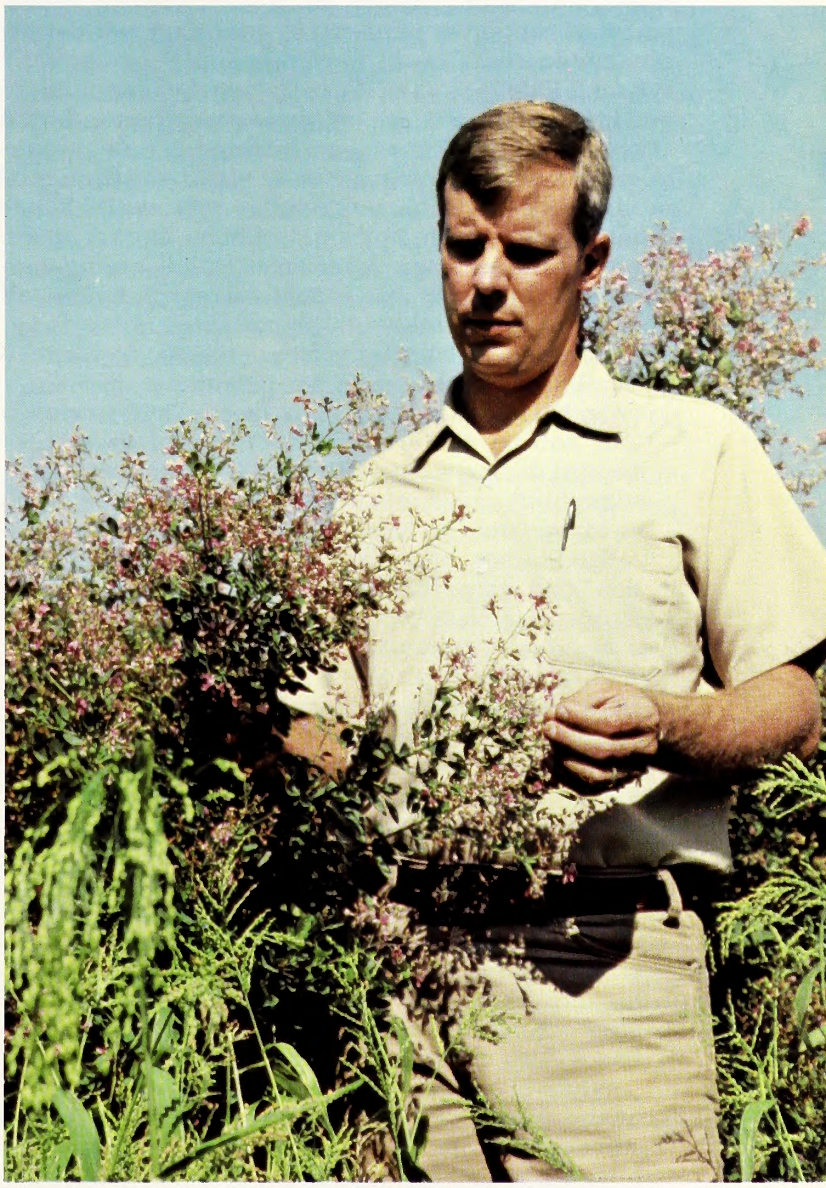
North Carolina did not escape this nation's rush for industrial and agricultural prowess. By the late 1930's, illegal hunting and extensive habitat damage combined to reduce native wildlife populations to low levels. With the creation of the Wildlife Resources Commission in 1947, the Division of Game was directed to formulate management programs designed to effect positive change with respect to the critical wildlife situation in this State.

This action was without a doubt the right policy at the right time since extensive land areas were beginning to recover from many years of abuse. The time was now ripe to apply sound game management techniques based on proven biological principles to ensure the timely restoration of North Carolina's game populations.

In this report it would be impossible to tell the complete story of this successful wildlife restoration effort. We can simply say — with pride — that a wildlife resource which was in trouble 30 years ago now yields a significant harvestable surplus to be enjoyed by almost 500,000 sportsmen who take to the field annually.

Significant challenges remain as we oversee a natural resource which must be intensively managed and regulated. User demands are expected to increase rapidly in the future while available land for hunting and other recreational use will, to say the least, not be plentiful. The next 30 years will no doubt bring challenges, but we are confident that these can be met in a manner such that the current high quality wildlife program will continue in North Carolina.

DIVISION FUNCTIONS AND ORGANIZATION The Division of Game has several functions within the total administrative framework which guides the operation of the Wildlife Commission. Important functions include regulation, management, and research responsibilities. For example, the division is responsible for the formulation of regulation proposals from which annual hunting and trapping regulations are adopted. The planning and implementation of wildlife improvements on public, private, and Commission-managed properties are significant program activities on which a significant portion of the division's effort is directed.



Sid Baynes

Harlan Hall, supervising wildlife biologist of the Central Wildlife Districts, checks a special planting of wildlife food (above). The Wildlife Commission has an active and successful wild turkey management program. This turkey is being fitted with a radio transmitter so that its movements can be tracked (right).

Charles Hill

This work is accomplished by a staff of 29 field biologists and 40 wildlife management technicians. The Raleigh staff consists of a division chief, two assistant chiefs, a division secretary, and a stenographer. Important staff support is rendered by part-time and temporary employees.

WILDLIFE INVESTIGATIONS During the biennium, 13 major research and survey projects were conducted statewide. These studies were initiated to find answers to questions concerning the basic status and biological needs of this State's native wildlife species. While we cannot address each study individually in this space, some significant research information has been generated from this work that should be reported. The following is a brief synopsis of these items:

Although woodcock are not as popular in North Carolina as in other areas, the potential is there. In order to learn more about this species' movements and habitat preferences, over 800 birds were banded during the period. Band returns show that some birds move into breeding areas as far away as Maine and Quebec, Canada.

Wild turkey restoration efforts are continuing in this State. Since 1970 almost 300 turkeys have been trapped for release on Mountain restoration areas.

In order to find ways to improve stocking success, a research project was initiated in May of 1977. This work was designed to monitor movements, mortality causes and reproductive capabilities of relocated wild turkeys. Birds on the study site are being monitored by radio-telemetry techniques. Some initial results indicate that relocated birds may range over an extremely large area, averaging up to 7,000 acres.

Research is also continuing on North Carolina's largest game mammal, the black bear. Harvest surveys show that 469 animals were taken by hunters during the biennium. Stomach samples were collected from 62 bears, and these have been sent to labs for detailed food habits analysis.

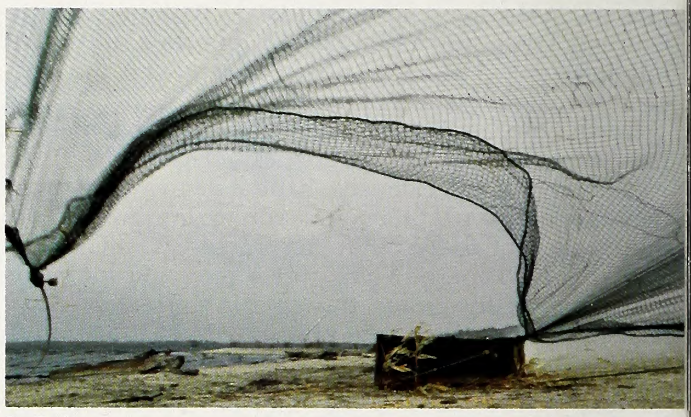
White-tailed deer studies are an important part of the division's research program. Recent mail surveys indicate that this big game mammal is now the number two game animal based on the number of hunters participating and hunting trips made annually.

During the biennium, a new technique has enabled the division to better evaluate area deer herd conditions and thereby set proper hunting regulations. This technique involves the counting of tiny parasites in the fourth stomach (albomasum) of a deer. The average parasite load counted in a five deer sample taken from a study site gives an indication of an area's capacity to support the deer herd. Albomasum parasite collections were made by division biologists in 64 separate areas statewide during the past two years.

A study of mountain raccoons began in 1976 to determine why populations in western North Carolina have remained at low levels even though substantial stocking efforts have been made over the years.

Radio telemetry is also being employed in this study to monitor native and non-native raccoon movements. Although the study has not been completed, data collected to date indicates that non-native animals often wander miles from the release site before settling down to establish a home range.

North Carolina waterfowl surveys represent a significant portion of the division's research effort. Work is carried out in cooperation with the U.S. Fish and Wildlife Service as a means of monitoring waterfowl populations in the Atlantic Flyway. As part of this effort, over 1,200 wood ducks are currently being banded each year. Data from



Ken Taylor

Terry Sharpe

A cannon net, fueled by powder charges, leaps out to trap wild game for various types of research and management (above). Wood ducks are trapped by cannon nets (above right) and banded. The birds are then released and the bands, when they are recovered later, provide valuable information. Controlled burning (right) is one of the management tools used to create improved habitat and food supplies for wildlife.

Tim Hergenrader

this banding effort has been instrumental in the establishment of a more liberal wood duck season for the past two years in North Carolina.

WILDLIFE SERVICES The backbone of sport hunting in this State has always been tied to the small, private landowner. Game birds and animals thrive on the varied habitat found on many farms. Thousands of sportsmen depend on these small properties for quail, rabbit, and squirrel hunting opportunities annually.

In order to assist these landowners with habitat improvement services, the Division of Game is responsible for a statewide technical guidance program which offers professional wildlife help to private, public, and corporate landowners. Components of this program include such activities as assisting small landowners and clubs with technical advice on the management of farm game species. During the biennium over 536 man-days were devoted to assisting 1,400 landowners with this type assistance.

A major tool in developing small game habitat is the Commission's program of producing and distributing, free of charge, such specialized planting materials as annual and perennial seed mixtures. The purpose is to establish food and/or cover for wildlife. During the biennium over 90,000 units (2½ to 5 lbs. each) were distributed to approximately 11,000 cooperating landowners.

A new technical guidance program was initiated during the biennium which has met with exceptionally good public response. This program, project RENEW, is designed as an "all out" effort to encourage landowners to manage lands for wildlife. Quality private hunting lands are not as plentiful today as in the past due to changing agricultural and land-use practices.

A significant part of RENEW is the Public Hunting Grounds Program. This program was designed to assist landowners with hunter trespass situations and at the same time to encourage these landowners to open their farms to local hunters. During the biennium, cooperative agreements covering almost 50,000 acres were signed with 165 landowners. This will provide a significant boost to hunters who need hunting recreation opportunities near their homes.

GAME LANDS DEVELOPMENT The approximately two million acres of game lands continued to be a major emphasis of the division's activities. The areas have transformed from a stage of locating boundaries and posting to a refinement and development stage. Due to a continuing urbanization of the State, especially in the Piedmont region, the demand for quality game lands continues to increase. Many urban hunters no longer have the family ties to the old home place and are now looking to the Wildlife Resources Commission to provide a place to hunt. Since it's also difficult for the Wildlife Commission to increase the total acreages in the game lands program due to other demands for land, more intensified development of existing game lands was necessary. To accomplish this goal, some 3,512 acres of wildlife food plots were seeded to various wildlife foods, such as annual seed mixtures, winter rye, fescue grass, orchard grass, various strains of clover, VA-70, and others. More than 145 acres of new

fields were cleared and seeded to wildlife foods. Not as dramatic and less noticeable to the average hunter, but probably more important as a total source of food for wildlife, was the review of timber management practices that were coordinated with landowners on game lands. The proper cutting of timber and regulated timber practices on game lands creates an important source of food. Due to the close association between Wildlife Commission biologists and professional foresters of state and federal agencies, many wildlife benefiting practices or modifications were incorporated into most timber cutting practices.

Even though most of the division's work is directed towards game species, increasing emphasis is being placed on non-game and endangered species projects. During the biennium, surveys to locate red-cockaded woodpecker colony sites were initiated on the Sandhills Game Land. Over 500 longleaf pine trees, which are used by this bird for nesting, were located and mapped for future reference. Over 6,000 acres have been treated with low intensity prescribed burns to improve habitat conditions for this species.

Since shrubs and mast producing trees are a principal source for wildlife foods, some 37,621 shrubs or trees were planted on game lands. These included plants such as autumn olive, chestnut, sawtooth oak, apple trees, and experimental varieties of honeysuckle vines and lespedezas. In addition to this planting, 3,255 apple trees and mast producing trees were pruned, fertilized, and released from adjacent competition.

In order to maintain existing permanent pasture fields for deer grazing and feeding areas for young turkeys and to provide wildlife openings, a total of 5,707 acres of mowing was accomplished by the use of mechanical mowing or hand clearing. In some sections of game lands due to the rough terrain, fields were cut back or maintained with hand labor. Food plots and permanent wildlife openings or pastures are usually relatively small averaging between one to two acres in size and randomly spaced throughout the areas where possible.

Since the habitat on many game lands responds to controlled burning as a producer of wildlife foods, some 12,531 acres were controlled burned using Wildlife Commission tractors and labor and additional acres burned through cooperative agreements with state and federal agencies.

In order to identify game lands and to facilitate locating and utilizing by sportsmen, 3,026 miles of boundary lines were either reposted and maintained or new areas posted with 6 inch x 6 inch metal game lands signs. All areas are reviewed annually and the game lands map book revised and reprinted showing new features or areas. A total of 75,000 game lands map books are printed and distributed each year.

Roads on Wildlife Commission-owned game lands are maintained by the Division of Game resulting in 1,147 miles of road grading and installation or repairs to 382 culverts or bridges. A total of 11 miles of new roads was constructed for hunter access on Wildlife Commission-owned lands. Roads on other leased lands are maintained by the landowners who contribute a valuable service to North Carolina hunters.

Charles Hill

Wild turkey populations have been restored to some areas, especially in the west, where turkeys have been absent for many years. This turkey is being released into its new home.

In order to expand deer populations into good unoccupied deer range, 276 deer were trapped during the biennium using a cannon net trap and moved to game lands in the western mountains areas. These transplanted deer were trapped from the Biltmore Estate in Buncombe County, Roundabout Farms in Wilkes County, and Roaring Gap in Alleghany County. Thirty turkeys were trapped and relocated to game lands that had good turkey habitat but no turkeys. A total of 14 wild boar was moved from the Great Smoky Mountains National Park to western game lands in cooperation with the U.S. Park Service.

WILD TURKEY HARVESTS, 1974-78

Coastal Plain	'74	'75	'76	'77	'78	Piedmont	'74	'75	'76	'77	'78	Mountains	'74	'75	'76	'77	'78
Bertie	10	5	4	5	9	Alamance	2	8	5	6	3	Burke	1	2	2	1	1
Craven	1	1	0	0	1	Anson	2	2	1	1	1	Caldwell	0	0	1	1	0
Halifax	0	5	1	0	2	Caswell	38	25	42	51	44	Cherokee	1	0	4	8	5
Jones	0	0	3	0	0	Chatham	8	12	10	12	5	Clay	0	2	1	0	0
Martin	5	1	2	5	7	Franklin	0	0	0	0	1	Haywood	1	0	0	0	0
Northampton	0	2	0	1	1	Granville	0	1	1	0	0	Henderson	0	1	0	0	0
Onslow	12	7	35	21	27	Guilford	0	0	0	2	0	Macon	2	1	2	0	4
						Johnston	0	3	1	5	3	Madison	0	0	1	0	0
						Montgomery	2	2	7	3	7	McDowell	3	0	1	0	1
						Moore	1	10	4	1	2	Mitchell	0	0	1	1	0
						Orange	0	0	7	3	6	Polk	1	2	1	1	0
						Person	4	3	10	16	8	Rutherford	0	0	0	1	0
						Randolph	0	0	0	1	0	Transylvania	0	0	0	1	0
						Richmond	2	2	3	3	1	Yancey	1	0	0	0	0
						Wake	1	4	1	1	1						
Totals	28	21	45	32	47		60	72	93	105	82		10	8	14	14	11

A Comparison of Hunter Participation and Success Rate For Major Game Species In North Carolina - 1974-75 and 1976-77*

Species	Hunters	Trips	Harvest	Kill Per Trip	Trips Per Hunter
Squirrel					
74-75	191,010(3.1)	1,131,111(5.9)	1,558,290(7.5)	1.40	5.9
76-77	175,061(2.3)	983,322(4.2)	1,447,521(4.9)	1.50	5.6
Deer					
74-75	161,860(2.7)	1,302,260(6.8)	53,079(5.3)	0.04	8.0
76-77	149,891(2.7)	1,219,700(5.8)	41,781(10.8)	0.03	8.1
Rabbit					
74-75	161,427(1.7)	949,244(4.6)	994,221(6.1)	1.10	5.9
75-76	134,355(2.6)	781,806(5.7)	790,884(8.0)	1.00	5.8
Dove					
74-75	131,888(2.4)	627,691(4.0)	2,276,993(4.7)	3.60	4.8
76-77	118,546(3.7)	539,199(4.7)	2,280,800(4.7)	4.20	4.5
Quail					
74-75	103,833(4.0)	779,413(8.8)	1,452,058(6.8)	1.90	7.5
76-77	83,050(5.0)	603,557(10.3)	947,521(10.6)	1.60	7.3
Ducks					
74-75	34,278(7.7)	264,542(13.2)	420,687(15.9)	1.60	7.7
76-77	24,400(8.9)	154,500(15.5)	231,027(23.4)	1.50	6.3
Raccoon					
74-75	33,964(8.1)	332,277(16.8)	208,611(21.5)	0.60	9.8
76-77	24,494(10.3)	292,881(16.0)	176,530(20.8)	0.60	12.0
Grouse					
74-75	16,340(8.5)	68,492(14.6)	38,154(17.5)	0.60	4.2
76-77	12,786(14.3)	63,925(29.4)	32,196(33.3)	0.50	5.0

*Proportional Standard Error shown in Parentheses
PSE = Std Error/Mean X 100

Division of Game

Hanson Carroll

State-Wide Waterfowl Kill and Hunting Activity

Year	Number Adult Hunters	State Goose Kill	State Duck Kill	Seasonal Kill Per Hunter	Rank in Atlantic Flyway Kill
1967-68	22,440	12,800	118,800	5.12	5th
1968-69	21,990	7,700	100,200	4.41	7th
1969-70	26,660	5,800	119,400	4.30	10th
1970-71	31,660	13,400	172,600	5.26	6th
1971-72	29,900	10,000	131,500	4.25	7th
1972-73	25,239	6,268	127,227	4.87	4th
1973-74	23,585	8,674	92,696	3.71	9th
1974-75	20,525	9,003	134,010	4.59	8th
1975-76	26,271	14,092*	138,216	5.08	5th
1976-77	27,411	21,202*	212,691	7.49	3rd
1977-78	29,161	15,895*	276,049	9.14	3rd
Averages	25,895	11,349	147,581	5.29	6th

*Includes snow goose harvest.

North Carolina Reported Deer Kill, 1976-78

	1976-77				1977-78			
District	Male	Female	Unknown	Total	Male	Female	Unknown	Total
1	3,642	974	20	4,636	4,100	1,892	11	6,003
2	5,390	267	36	5,693	5,034	562	44	5,640
3	3,510	812	10	4,332	4,364	2,223	23	6,610
4	3,028	10	13	3,051	3,493	321	13	3,827
5	1,168	17	4	1,189	1,355	30	6	1,391
6	1,240	24	9	1,273	1,674	513	7	2,194
7	947	18	4	969	1,143	49	0	1,192
8	815	43	3	861	794	49	0	843
9	540	68	2	610	566	84	1	651
No County Listed	545	21	4	570	321	78	20	419
State Totals	20,825	2,254	105	23,184	22,844	5,801	125	28,770
Percent	90	10	—	100	80	20	—	100

Division of Inland Fisheries

Fishing improves under sophisticated management techniques and efforts to maintain a quality environment.

The role of the Division of Inland Fisheries has changed dramatically since formation of the Wildlife Resources Commission in 1947. Early efforts by the Division were directed toward finding out what the problems were. After all, except for a few radical scholars who claimed to have studied such, everyone knew that the way to improve fishing was to "stock more fish." Fishery programs then took on a double barreled approach, with one barrel aimed at testing the effects of stocking and the other aimed at determining the status of the resource and in finding out which cures (management procedures) worked.

This period, referred to loosely as "research, surveys, and inventories," lasted into the mid-to-late sixties when we realized that we had gathered sufficient background knowledge to do a creditable job of fishery management. With inventories completed and research having established many basic management techniques, fishery program emphasis was shifted to application of management techniques designed to improve the resource and program plans reflected the change. This program direction seems to be ideal if it is tempered with the proper amount of inventory and research to keep knowledge up to date. However, before management programs could become fully implemented, environmental detriment problems took precedence and efforts since the early seventies have been directed primarily toward "saving the remaining resources" rather than toward "managing the resource for optimum benefit."

Continuing increases in public demands for services coupled with decreasing funds with which to perform those services threatens to further modify Inland Fisheries program directions. The following are major areas of activity of response to public need during the 1977-78 biennium:

RESEARCH AND MANAGEMENT SECTION Most fisheries work accomplished by research/management personnel of the Division of Inland Fisheries is funded by Federal Aid in Fish Restoration money and matching State funds on a 75% and 25% basis, respectively. Federal money is made available to the State each year through an annual apportionment of funds as set up under the Dingell-Johnson Act of 1950, which provides for a ten percent excise tax on various types of sport fishing equipment. State matching funds are derived from annual sales of fishing licenses. This type of federal funding allows the Division of Inland Fisheries to provide more programs and services for the sportsmen of North Carolina than normally could be accomplished by using only revenues from fishing license sales as operating money. Five basic types of activities are carried out in the research and management programs which result in the enhancement and/or maintenance of fisheries resources in North Carolina. A brief summation of accomplishments within these selected activities during the period of July 1, 1976 through June 30, 1978 follows.

TECHNICAL GUIDANCE Professional advice concerning the preservation and enhancement of fisheries resources was given to those individuals, companies and agencies involved in development, land-use planning and other like activities which could be harmful, or significantly alter existing aquatic resources. This technical guidance is directly responsible for ensuring that proper attention is given to the aquatic environment when projects are being considered which may have detrimental effects. During the last biennium (July, 1976 — June, 1978), more than 500 projects were inspected and reported on throughout the State by fisheries biologists.

Under technical guidance activities, advice is also given on proper fisheries management of farm ponds and private lakes to those who request the information and are responsible to carry out a management program. More than 600 private landowners and/or clubs were given advice on ways to improve or maintain a satisfactory fishery in private waters during the last biennium.

Rick Estes

The Division of Inland Fisheries often uses nets to sample bodies of water to gather information about existing fish populations.

Division of Inland Fisheries

DEVELOPMENT This activity involves fish stocking, formulating fishing regulation changes and writing informational brochures for public distribution.

Fisheries biologists determine the need and make annual recommendations on the species and numbers of fishes to be stocked in public waters within their assigned areas. Each stocking recommendation must be accompanied by a justification and is reviewed by supervisory personnel before being implemented. Stockings during the past two years have been for fish kill replacements, introduction of new species, routine stockings of catchable size and fingerling trout in mountain streams and maintenance stocking of striped bass in reservoir systems.

Proposed annual changes in fishing regulations is an important activity that is the responsibility of each fisheries biologist throughout the State. Most proposed changes are based on biological recommendations and/or for clarification of existing regulations which are misunderstood by the general public. Many regulation changes require that field data be collected by biologists for analysis and consequent recommendations on what regulation is necessary to keep harvest rates of certain species in equilibrium with fishing pressure. Fishing regulations, of course, is one of the most effective management tools available to the biologist to successfully manage public fishing.

Tim Hergenrader

Sorting through fish samples can be tedious work for fisheries biologists and technicians, but it takes a lot of this kind of work to obtain accurate information on the status of a fish population.

The dissemination of information on when, where, and how to catch various species of fish is an additional service provided by individual biologists. During the past two years division personnel have been involved in assembling a "Fishing Calendar" which, when published, will provide valuable information to the general public on catching various popular species of freshwater game fish through the State. Although the publication is not yet available, the major portion of the work has been completed and will be out shortly.

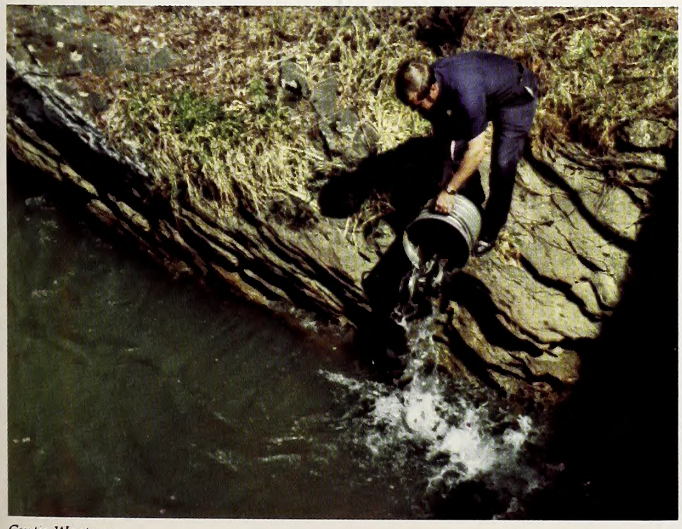
FISH KILLS It is the responsibility of the Division of Inland Fisheries to investigate all reported fish kills in public waters and to evaluate the extent of fisheries losses. In cases where a polluter is identified as having caused a kill, the investigative costs and charges for replacement of species which were killed make up the dollar value of the fine levied against the guilty party. If, however, the cause of a fish kill cannot be determined, the investigative cost is borne by the Wildlife Resources Commission. Approximately 75 fish kills are investigated annually across North Carolina. Many kills are the result of natural phenomena, while causes for many others cannot be specifically determined. Therefore, most investigative costs are never recovered by the Commission.

SURVEYS Fisheries surveys are the most effective means whereby biologists collect field data on fisheries population dynamics in selected bodies of water. Sampling methods include, electrofishing, netting, angling, trapping and the use of fish toxicants. Sampling of this type occurs annually and assists biologists in making decisions on stocking, habitat manipulation, proposing more or less stringent fishing regulations and recommending uses of other management techniques which attempt to improve fishing in public waters. Approximately one-third of the work time during the last biennium was spent in fisheries survey work, report writing and formulating management recommendations based on these surveys.

RESEARCH Fisheries research conducted by division personnel is referred to as "applied research" which denotes that the results of a study will be useful in formulating innovative management techniques which, in turn, will hopefully improve public fishing. Needless to say, some study results do not achieve this ultimate goal; but even at that, sometimes it is justifiably important to find out there is no way to improve a fishery through a short-term investigation than to spend years in haphazard management based on a trial and error system.

Two final reports were completed on studies involving investigations of large-mouth bass populations in coastal streams. Information on bass life histories in this type of environment is inadequate and mostly non-existent. The results of these studies have wide management implications and will enable coastal

Curtis Wooten



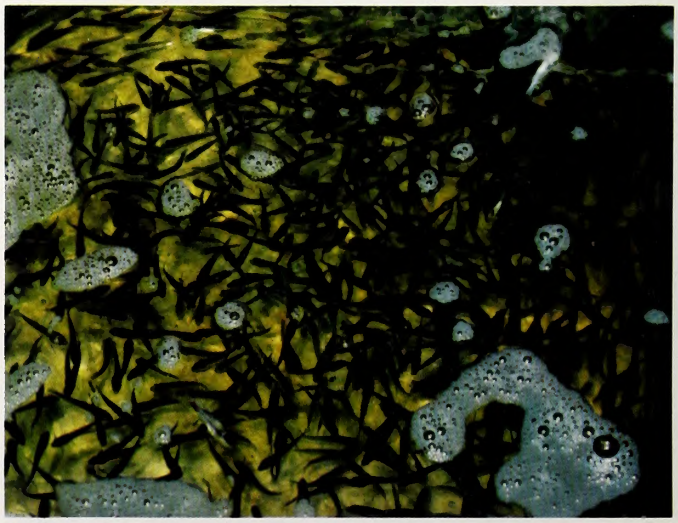
Curtis Wooten

In the cold water trout streams in the western part of North Carolina, biologists and technicians use electro-shocking to temporarily stun fish in order to learn more about the health, reproductive capability and size of a trout population (above). When necessary, especially in waters under "General" trout regulations, trout are stocked (left).

Division of Inland Fisheries

Curtis Wooten

Trout stream restoration is one of the projects underway on streams in the western part of the State (above). These wing dams concentrate the stream flow and create pools and oxygenated water where trout can live and feed. These fingerling largemouth bass (right) were used in experiments at the Fayetteville Hatchery during the biennium.



Tim Hergenrader

biologists to make more intelligent decisions on future management of this species in the coastal area of our State.

Other research studies which are in various stages of completion are listed below by study title and major objectives.

Study: A comparison of growth rates and angling susceptibility between the Florida and the Northern subspecies of largemouth bass.

Objective: To determine if the Florida largemouth bass, *Micropterus salmoides floridanus,* is superior to the native North Carolina largemouth, *M. s. salmoides,* in growth rate under identical conditions. Also to determine if there is any significant difference in susceptibility to angling between the two subspecies. A close watch will also be made for parasites and diseases which are uncommon to our native bass populations.

Study: Determination of the Management Potential of Spotted Bass.

Objective: To determine potential for an additional sport fishery in areas with low game fish populations and poor fisherman utilization.

Study: Determination of Albemarle Sound Sport Fishery Harvest with Special Emphasis on Striped Bass Harvest Rates and Growth.

Objective: To gather pertinent information on the striped bass and other sport fisheries of Albemarle Sound and its major tributaries, and to make proper management decisions from these data, thereby maintaining and enhancing this resource.

Study: An Evaluation of the Sport Fishery Potentials of the Original (SB x WB) and Reciprocal (WB x SB) Striped Bass x White Bass Hybrids in Small Lake Management.

Objective: To develop a small lake fisheries management program, in selected bodies of water, by introducing original and reciprocal crosses of striped bass x white bass fingerlings and evaluating its success.

Study: Development of the Sport Fishing Potential of an Industrial Cooling Lake.

Objective: To trace the environmental changes and fish population development in Belews Lake both before and after the introduction of heated water, and to recommend feasible measures for realization of the full sport fisheries potential of the cooling lake environment.

Study: Sport Fishery Potential of Hybrid Sunfish in Ponds and Lakes.

Objective: To evaluate the growth and reproductive potential of hybrid sunfish from selected crosses when stocked into small lakes and ponds.

Study: Largemouth Bass Catch Survey.

Objective: To establish indices for the quality of largemouth bass fishing in North Carolina waters and to detect any trends in these indices which may occur during a four-year period.

FISH CULTURE Since the last biennal report, the North Carolina Wildlife Resources Commission closed down the Roaring Gap Fish Hatchery because of diminishing water supply. Currently, the Fish Culture Section of the Division of Inland Fisheries operates five fish hatcheries plus the seasonal striped bass egg procuring station at Weldon. Armstrong and Waynesville Hatcheries orient their fish culture activities entirely toward cold-water fishes — brook, brown, rainbow and steelhead trout. Marion and Table Rock Hatcheries are multi-purpose facilities in that the capability exists at each station to rear cold-water, cool-water and warm-water fishes. Fayetteville Hatchery is maintained as a warm-water fish rearing and research station.

All of the hatcheries received a much needed face lift during the biennium — new water lines were installed to the rearing ponds at Fayetteville, self-cleaning intakes were constructed at Armstrong, drainage facilities and dirt pond renovation was implemented at Marion, pollution abatement facilities were installed at Waynesville and Armstrong and the electrical wiring was upgraded to OSHA specifications at all of the hatcheries.

A program to acquire additional water to be added to the Designated Trout Water List was instigated. A Trout Waters Reclamation Coordinator was appointed with the vested responsibility of acting as negotiator with landowners in trying to obtain additional miles of trout water in which the public may fish. Thus far 116 miles of "new" streams and 3½ acres of lakes have been added.

Fishes stocked into the public waters of North Carolina during the July 1, 1976 — June 30, 1978 biennium are summarized as follows:

Warm-Water Fish Stocking in North Carolina 1976-77

Species	1976 - 1977 No. Stocked	1977 - 1978 No. Stocked
Blueback Herring	2,272	
Bluegill	70,000	7,000
Bluegill Hybrids	40,127	
Channel Catfish	96,516	
Largemouth Bass	1,081	189,450
Redear	111,970	3,000
Robin	4,000	
Spotted Bass	22,240	46,802
Striped Bass Hybrids	5,644	151,600
Threadfin Shad	92,449	
White Bass Hybrids	6,880	150
Green Sunfish Hybrids		64,000
Totals	453,179	462,002

Division of Inland Fisheries

Trout Stocking In North Carolina, 1976-77
State Distribution

Species	Yearlings	Pounds	Fingerlings	Pounds	Brood Fish	Pounds
Brook Trout	121,483	18,372	589	79	1,114	1,226
Brown Trout	111,295	56,340	17,486	554	2,201	4,278
Rainbow Trout	174,297	37,387	44,166	2,669	1,789	2,604
Steelhead Trout	25,517	4,725				
Totals	311,109	60,486	62,241	3,302	5,104	8,148

Federal Distribution

Species	Yearlings	Pounds	Fingerlings	Pounds	Brood Fish	Pounds
Brook Trout	35,465	8,730				
Brown Trout	70,300	10,226				
Rainbow Trout	187,893	43,530				
Totals	293,658	62,486				

Trout Stocking In North Carolina, 1977-78
State Distribution

Species	Yearlings	Pounds	Fingerlings	Pounds	Brood Fish	Pounds
Brook Trout	62,126	15,401	207,800	131	14	2
Brown Trout	78,220	15,717	120,417	1,014	1,839	503
Rainbow Trout	193,244	52,032	184,179	4,472	1,089	1,503
Steelhead Trout	26,078	3,359				
Totals	359,668	86,509	512,396	5,617	2,942	2,008

Federal Distribution

Species	Yearlings	Pounds	Fingerlings	Pounds	Brood Fish	Pounds
Brook Trout	20,950	5,116	6,550	1,845		
Brown Trout	42,900	10,115	20,400	4,863		
Rainbow Trout	172,050	44,269	33,550	10,083		
Totals	235,900	59,500	60,500	16,791		

Cool-Water Fish Stocking In North Carolina, 1976-77

Species	1976-1977 No. Stocked	1977 - 1978 No. Stocked
Muskellunge	2,415	6,543
Smallmouth Bass	24,148	70,772
Tiger Muskellunge	5,710	7,655
Walleye	265,954	133,800
Totals	298,227	218,770

Anadromous Fish Stocking In North Carolina, 1976-77

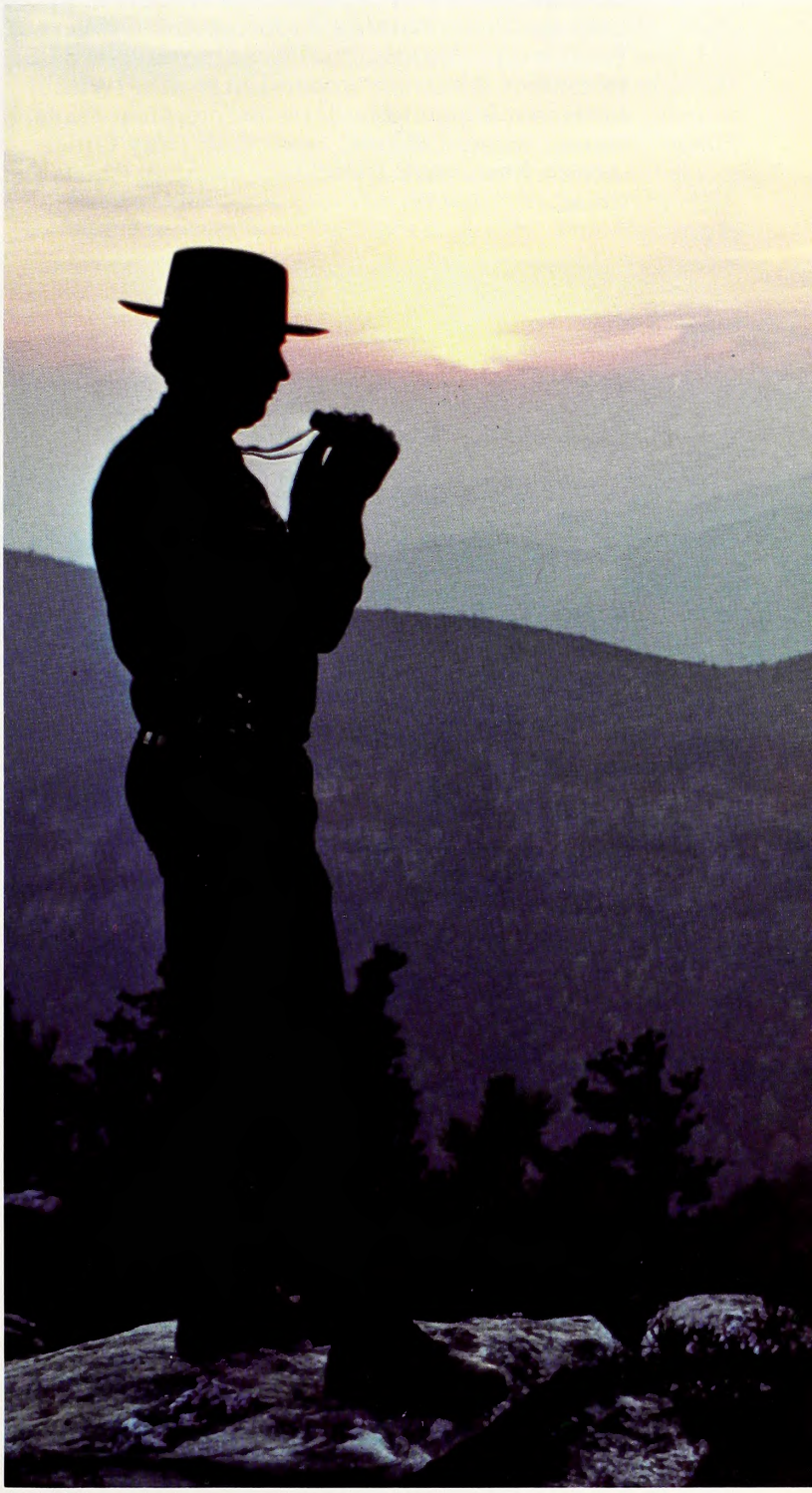
Species	1976-1977 No. Stocked	1977-1978 No. Stocked
Striped Bass		
Eggs	17,370,000	100,000
Fry	783,000	2,126,000
Fingerling	358,098	417,744
Totals	18,511,098	2,643,744

Division of Enforcement

North Carolina's 207-man unit of officers is recognized as one of the nation's most efficient wildlife enforcement divisions.

Upon formation of the North Carolina Wildlife Resources Commission in 1947, its enforcement staff consisted of approximately 120 Game Protectors scattered throughout the State. These officers, while dedicated to their work, were not provided with complete uniforms, equipment, vehicles nor a system of internal communications. Each officer operated independently, with almost no coordination with the officers patrolling adjoining areas. Training of these officers was rudimentary at best, and internal discipline was generally only what individual officers wanted it to be. Today, the 207 sworn officers of the Division of Enforcement are generally conceded to be among the most carefully selected, best trained and most disciplined in the State, as indicated by the following paragraphs.

PERSONNEL During the biennium 1976-78, three Staff Duty Officers were added to the Division. These are experienced enforcement officers who man the Division's radio communication system, telephones, Police Information Network terminal and an incoming Wide Area Telephone Service (WATS) line. This addition to the staff provides the public with an experienced officer who may be contacted outside regular office hours, via toll-free telephone service, for the purpose of reporting violations or obtaining information on North Carolina's hunting, trapping, fishing or boating laws. The en-



Curtis Wooten

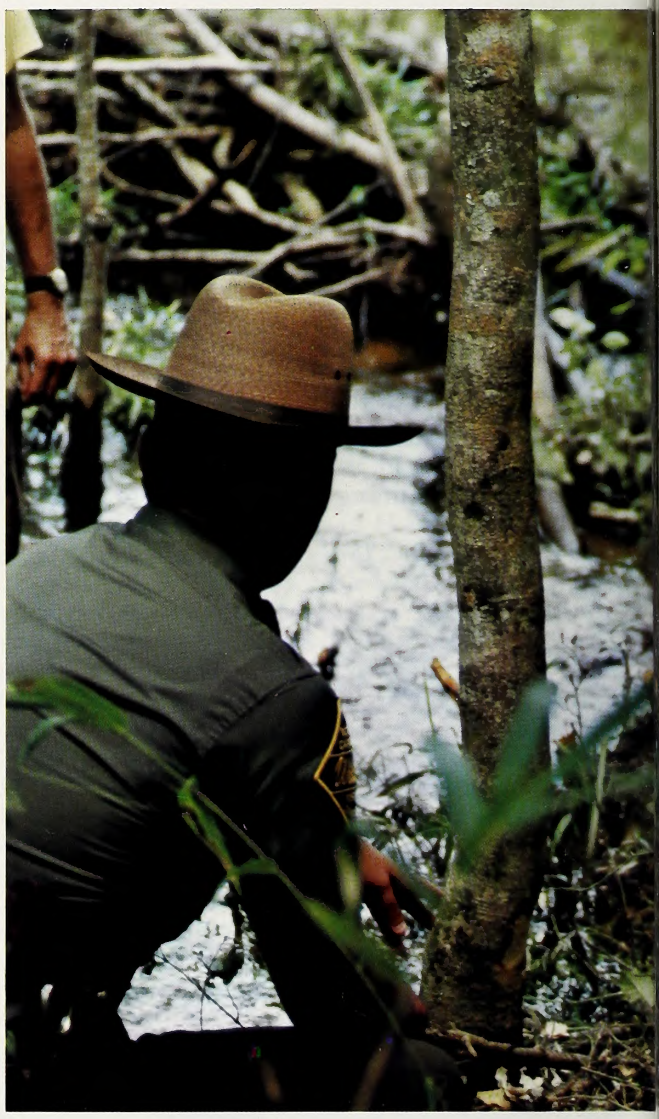
Tim Hergenrader

The Wildlife Commission's enforcement officers are on the lookout for game and fish law violators throughout the State on a virtually 24-hour basis. This officer (above) checks a mountain area with binoculars. Officers also check fishermen and boaters (left) for violations.

Division of Enforcement

forcement staff now consists of 88 Wildlife Enforcement Officers I, 53 Wildlife Enforcement Officers II, 36 Wildlife Enforcement Area Leaders, nine Wildlife Enforcement Assistant Supervisors, nine Wildlife Enforcement Supervisors, three Enforcement Pilots, three Hunter-Safety Officers, three Staff Duty Officers, one secretary, one clerk-typist, two Assistant Chiefs and the Chief.

Jim Dean



In addition to checking licenses (left), wildlife enforcement officers also take an active part in helping young people learn more about wildlife (above). The Division of Enforcement has four airplanes which it uses to cut down on game and fish law violations (right).

Luther Partin

Ken Taylor

TRAINING The demands of law enforcement today require training far above that available at the 1947 level. Today's wildlife enforcement officer is trained at and by the Institute of Government of the University of North Carolina at Chapel Hill. The Institute of Government is probably the premier law enforcement training agency of its type in the United States, and the 14 weeks of Recruit and Basic training provided there for the division's officers is of the highest quality. This training is supplemented by special courses conducted by the staff of the North Carolina Justice Academy, at Salemburg. These agencies also provide the training in personnel management which have greatly improved internal management and the internal discipline which is vital to any effective enforcement agency.

EQUIPMENT All the division's 202 patrol vehicles and most of its 120 patrol boats are now equipped with two-way radio; however, duuring the 1976-78 biennium final planning was done on the new, more sophisticated statewide radio for which a contract has been signed, and which will be operating by April 1979. This, with the Staff Duty Officers, the incoming WATS service [at (800) 662-7137] will provide quick-response enforcement and ready access to all the State's citizens.

FIELD OPERATIONS The following summary of data on the division's enforcement effort during the biennium will provide an indication of the division's effort:

Biennium 1976-78	
Number of hunters, anglers, trappers, etc. checked — 707,841	
Number of violations	27,158
Violation rate	3.8%
Number of convictions	23,882
Conviction rate	87.9%
Number of boats inspected	189,135
Number of violations	9,728
Violation rate	5.1%
Number of convictions	8,619
Conviction rate	88.6%
Number of Hours of patrol, game & fish laws	622,833
Number of hours of patrol, boating law	70,126

FIREARM AND HUNTER-SAFETY EDUCATION The North Carolina Firearms and Hunter Safety Education Program reaches more students each year. The greatest growth is shown in the 1976-78 biennium in which 59,748 students were trained.

The majority of these students were trained during Junior High. Hunter Safety Officers also spent their time during the summer training students at youth camps throughout the State.

A total of some 1500 instructors was active in the program during the 1976-78 biennium. During this period, 444 instructors were certified.

In the 1964-66 biennium, a total of 145 hunting accidents was reported of which 35 were fatal. During the 1976-78 biennium, there were only 54 hunting accidents reported and 12 of these were fatal.

Division of Boating

North Carolina's Division of Boating sweeps top national awards for boating safety and boating access areas.

Since its creation in 1969, the Boating Division has been responsible for the administration of the State boat law and the boating programs of the Wildlife Resources Commission, with the exception of law enforcement and registration.

During the past biennium the motorboat registration section was transferred from Administrative Services to this division. This reorganization has resulted in improved administrative direction and more efficient use of personnel and funds. In the last year of the biennium, registration renewals were processed on a daily basis and the level of services to boaters was raised. In calendar year 1977, 177,254 motorboats were registered.

The funds from registrations and from the small portion of the State tax on gasoline which we receive, along with Federal funds from the United States Coast Guard, finance the boating program. This program is dedicated to returning the boater's fees to him in the form of services.

Recognition of our efforts was obtained at the annual conference of the Southeastern States Boating Law Administrator's Association in Nashville, Tennessee, in the summer of 1978. The Division of Boating swept top honors for the most outstanding overall program in the nation in boating safety. The Division also won first-place recognition for its highly popular boating access area program and received the first-place award for boating law enforcement.

North Carolina's three first-place awards were won in competition with 12 other southern states and two territories.

ACCESS AREAS AND WATERWAY MARKING The public's strong demand for additional free access to the waters of North Carolina continued during the biennium; and in response to this demand, six new boating access areas were developed and opened to the public. The construction of these areas represents an investment of approximately $65,800.00.

The most significant accomplishment during the period was the development of the Wrightsville Beach Access Area. This area serves a long-standing need for public boating access to the Wrightsville Beach area. The completion of this access area resulted from the cooperation of local, state and federal agencies. The land was acquired by the Town of Wrightsville Beach and donated to the State for development. The United States Army Corps of Engineers installed dikes around the site and placed the initial lift of hydraulic fill. Students from the Marine Construction Program of Cape Fear Technical Institute in Wilmington secured on-the-job training by assisting our personnel in the construction of the bulkhead. The design and construction of the access area was done by Division of Boating personnel. This total project involved the construction of approximately 1,000 lineal feet of bulkheading; 20,000 cubic yards of fill and 2,000 tons of marl for the parking area. This new area has proven to be very popular with the public and it receives constant and intense use.

The new areas developed during the biennium are:

1) East Lake Ferry, Alligator River, Dare County
2) Grifton, Contentnea Creek, Pitt County
3) Turkey Creek, Intracoastal Waterway, Onslow County
4) Castle Hayne, Northeast Cape Fear River, New Hanover County
5) Waccamaw River, Waccamaw River, Brunswick County
6) Wrightsville Beach, Intracoastal Waterway, New Hanover County

On June 30, 1978, 130 free public access areas were in operation throughout the State. In addition to the new areas completed, several existing areas were expanded or renovated.

During the biennium, the statewide waterway marking program continued to expand with the installation of 110 additional navigational aids. As of June 30, 1978 a total of 444 waterway markers were being maintained throughout the State. This marking program has made the waters of the State safer to the boater and has reduced accidents resulting from waterway hazards.

BOATING SAFETY EDUCATION One of the important accomplishments of the Division of Boating has been the development of a leading state boating safety program. The impetus for the development of the program came in the form of a federal grant received under the guidelines of the Federal Boat Safety Act of 1971.

The funds, earmarked by Congress specifically for boating safety purposes, in addition to funds the Wildlife Resources Commission provided, have enabled the Division of Boating to increase its boating education efforts from a one-man operation in 1972 to a five-man section in 1978. The boating education program development has had a positive impact on recreational boating safety in this State as seen by a constant decline in the boating fatality rate from 65.8 in 1972 to 33.0 in 1977.

The Division of Boating has basically relied on three methods to encourage safer boat operation. Short term "shock" boating education efforts such as television and radio spots have been used to demonstrate the need for safer boat operation to the public. Medium range programs, such as the production and distributing of boat operation booklets and manuals to boat owners have enabled many boat operators to develop good operating habits. And the long-range plan for encouraging safer boat operation has been the offering of a boating education course to junior high school students.

The boating education course, now in its fifth year in the school systems in North Carolina, has become the main emphasis of the Commission's boating safety program. Over a quarter million students have com-

Luther Partin

Motorboat registration provides more than a way of locating owners of boats. It also provides funds for boating access areas, boating safety education and waterway marking programs. The waterway marking program is having a positive effect in reducing boating accidents. This buoy (left) is being placed on Tranters Creek near Washington to warn boat operators of a sunken barge.

pleted the six-hour instruction course. Response from students and schools has been very good with the demand for the course constantly increasing. From an initial order of 25,000 course texts in 1974, the demand for the course has grown to a point where over 88,000 students will complete the boating safety course during the present school year.

COOPERATIVE EFFORTS A boating safety art contest sponsored by the Wildlife Commission and the Department of Public Instruction is presently in progress. This joint venture is aimed at encouraging a boating safety awareness among young people. At the same time students are becoming aware of boating safety practices, individual creativity and artistic ability is being recognized and fostered.

Cooperative efforts in the field of boating safety with the Coast Guard, Coast Guard Auxiliary, Power Squadrons, Red Cross, Army Corps of Engineers, marina operators, local water safety organizations, state agencies, and other states were successful in promoting safer boating in North Carolina.

Of particular importance during the past biennium was the continuation of a joint study by the Medical Examiners Office and the division concerning the use of alcohol by boat operators involved in fatal boating accidents. This study has given us some hard facts into the problem of alcohol on the water. Toxicology tests indicate that one out of every two victims tested had consumed alcohol prior to the accident. Of those who had been drinking, over 50 percent had enough alcohol in their blood to be considered Driving Under the Influence had they been operating a motor vehicle. Alcohol was a contributing factor in at least ten boating deaths in 1977.

The Division of Boating is also charged with the responsibility of investigating requests for local boating regulations. While we support local regulations designed to eliminate specific boating hazards, we must weigh the benefits of a regulation against the undue burden placed on boaters using the waters. We then must make a recommendation, based on our findings, to the Wildlife Commission for its decision on the matter.

BOATING ACCIDENTS Boating accidents occurring on public waters of North Carolina are required to be reported to the Wildlife Resources Commission. These reports are collected by the Division of Boating. The purpose of the accident report is to provide statistical information on the causes, frequency and location of serious boating accidents. These statistics are analyzed to aid in determining the direction of measures to deter boating accidents.

During the past biennium ending June 30, 1978, one hundred and one lives were lost in boating accidents in North Carolina. Capsizings, falls overboard, and sinkings were the most frequent types of accidents in which a death occurred. Weather conditions were a major factor in the cause of many accidents. However, in most of these cases, the accident resulted from an operator error such as anchoring the boat from the stern in rough weather.

Tim Hergenrader

The Wrightsville Beach Access Area was completed during the biennium and opened just in time for the past Fourth of July weekend. As with the other 129 boating access areas maintained by the Commission, the area provides free access to the water 24 hours a day.

Registered Motorboats/ Show Increase

1968	—	64,788
1969	—	70,687
1970	—	76,239
1971	—	82,983
1972	—	92,607
1973	—	104,548
1974	—	113,656
1975	—	123,391
1976	—	164,010
1977	—	177,254

Interagency Wildlife Coordination Section

Environmental review, endangered species work receive increased attention during the 1976-1978 biennium.

Established August 1, 1974, the Interagency Wildlife Coordination Section is the newest administrative unit of the Wildlife Commission. Its establishment was necessitated by a number of recent developments in the area of wildlife conservation. One of the most important of these was the enactment of several environmental protection laws at state and federal levels. These laws specified that any major construction or program that had a potential for impact upon the environment be preceded by a study of such potential impact and modification so as to preclude or reduce adversities. Before construction or program enactment, these environmental impact statements were to be reviewed by various agencies, including those responsible for wildlife conservation, to ensure that all pertinent issues were addressed and impacts upon fish and wildlife correctly assessed.

Other laws required that federal and/or state permits be secured prior to dredge or fill in coastal areas or initiation of construction or waste disposal that might adversely impact quality of public waters. The application review process included the Wildlife Commission since resources under its surveillance could be seriously affected by such development. Still other laws were enacted that provided for development of plans and programs for correcting past (as well as on-going) abuses of our public waters, and it was important that fish and wildlife agencies participate in development of such clean-up programs.

Passage of the federal Endangered Species Act of 1973 provided for federal funding of state programs in this important area of natural resources conservation. Participation by the State required establishment of an administrative unit within the Wildlife Commission. Similar legislation relating to non-game wildlife conservation is currently pending in Congress.

Enactment of these laws brought into sharper focus the need for establishing closer working relationships with other agencies in both state and federal government to ensure that their programs be conducted in harmony with fish and wildlife conservation. It became obvious that an interagency liaison initiative would constitute strong support for the various fish and game conservation programs of the Commission and help to prevent erosion of such programs by the work of other agencies. It was also determined that assignment of such work to existing already over-worked administrative units within the Commission would detract from their efficiency in fish and game management. It was for these reasons that the Interagency Wildlife Coordination Section was established as part of the Director's office.

During the biennium, a total of 1405 environmental impact statements (EIS) and permit applications was reviewed by the Section. EIS review entailed determination of adequacy and accuracy of fish and wildlife information contained and anticipated impact upon same. Many cases involved making recommendations regarding selection of alternative courses of action and in other cases it was necessary to make recommendations in regard to program design.

The largest number of reviews (993) was of applications for state and federal permits for water-related construction or waste discharge into public waters. Most of these (82%) were determined to have little if any adverse impact on fish and wildlife resources; but in 18% of the cases, recommendations were made to modify the proposed project to prevent significant damage. In most cases these changes were made by the applicant.

Other examples of liaison initiative included participation in a series of educational slide shows for the benefit of local highway maintenance crews to demonstrate the need for prevention or erosion because of its impact on fisheries resources and methodology for accomplishing same. In this same area we pressed for proper design (from a fisheries standpoint) of new stream channels where it was necessary to move a stream because of highway construction. We also participated in development of the State's water supply management program as well as the development of the program to reduce water pollution from "non-point" sources. We participated in review of research propos-

Tim Hergenrader

A new program of stream restoration is being considered as a possible substitute for stream channelization. The Wildlife Commission's Interagency Coordination Section is monitoring the evaluation of this new technique which clears old stream channels of silt and debris without straightening the streambed.

als and programs of the Water Resources Research Institute and in workshops conducted by that agency.

Other examples of interagency coordination included monitoring of chemical control of vegetation in reforestation programs, control of sedimentation resulting from mining operations, development of the State's position in regard to diversion of water to another state, development of guidelines for clearing and snagging of Chicod Creek and design specifications for Corps of Engineers stream channelization projects.

In working with private agencies we were successful in pressing for the recognition of the possibility of selenium poisoning as the result of the construction of a power plant and in requiring that provision be made for prevention of same. We also participated in the de-

R.F. Soots Jr.

The Interagency Coordination Section is active in research projects to learn more about and protect endangered and threatened wildlife species. Here, personnel take part in alligator banding (below) and also banding of brown pelicans (right). The banding of this young pelican will help biologists learn how to ensure that North Carolina's estimated population of 200 brown pelicans can survive.

Tim Hergenrader

velopment of study plans of the environmental impact of a major power complex in an adjoining state since such impacts will also affect resources in this State.

Considerable time was devoted to the development of land allocation recommendations and long-range management plans for the Falls of Neuse Reservoir. Similar work was continued on the Jordan Reservoir. This entailed working with the Corps of Engineers, and their contract planners, the State Division of Parks, and several other State agencies.

One of the most significant accomplishments during the biennium was the development of the concept of stream restoration as a substitute for channelization. Hopefully this will have the effect of resolving the stream channelization controversy that has been of concern to fish and wildlife conservationists, nationwide for the past decade and a half. Briefly stated, this concept requires that in situations where accelerated stream flow is needed to reduce flooding, channel work be restricted to removal of debris, logs and sediment, with minimum right-of-way and no berming of spoil, thereby preventing degradation of fish habitat and ensuring preservation of swamp wildlife habitat. Reinforced by concurrence of federal environmental agencies, this concept appears to be gaining acceptance by construction agencies.

One member of the Section's two-man field crew transferred to another Division of the Commission during the biennium and several months of searching and interviewing were required to locate a qualified replacement. The function of the crew is to conduct inventories of fish and wildlife resources in watersheds under consideration for flood control work through the PL566 program of the Soil Conservation Service. During the biennium the crew completed work on the Little Contentnea Watershed in Edgecombe, Greene, Wilson and Pitt counties, on the South Yadkin Watershed in Alexander, Iredell and Wilkes counties, and on the Chicod Creek Watershed in Pitt and Edgecombe counties. A new study contract was negotiated for an assessment study of the Wet Ash-Bear Branch Watersheds in Brunswick County, and this work was still in progress at the end of the biennium.

Pursuant to determination by the State Attorney General that existing legislated authorities are sufficient to qualify the Wildlife Commission to participate in the Federally funded endangered species program, efforts to enact special enabling legislation were dropped and a State program was developed. To provide for participation by other agencies, a 21-member Interagency Task Force was established consisting of representatives of state and federal agencies whose programs could impact or be impacted by the endangered species program. To provide for public input and program guidance, a ten-member Advisory Commission was appointed (later increased to 12). The Committee is charged with responsibility for screening endangered species study proposals, developing recommendations for designation of endangered and threatened species, and enactment of regulations as may be needed. Official designation, regulation enactment, and enforcement remain the prerogative of the Wildlife Resources Commission.

Two meetings were conducted of both the Advisory Committee and the Task Force during the second year of the biennium and a research, development and public information program was developed, which was subsequently approved by the U.S. Fish and Wildlife Service for funding. Three University research projects were contracted, one of the eastern brown pelican with UNC-Wilmington, and others on the alligator and red-cockaded woodpecker with NCSU-Raleigh. Development work scheduled was in relation to red-cockaded woodpecker habitat improvements on the Sandhills and other Commission-owned game lands. Public information work provided for funding of articles in WILDLIFE IN NORTH CAROLINA.

Other actions in the area of endangered species included Commission designation of the Spotfin Chub as "threatened" pursuant to such designation by the U.S. Fish and Wildlife Service; conduct of a public hearing and development of a response to the U.S. Fish and Wildlife Service that designation of certain fishes in Lake Waccamaw as endangered be postponed pending further study; and development of controls for export of otter and bobcat pelts.

Environmental Impact Statements Reviewed

Kind	Number Reviewed	Number Recommended For Denial or Modification
Environmental Impact Statements	49	*
Highway Construction Plans	48	*
Airport Construction or Expansion Plans	6	*
Sewer System Construction Plans	113	*
Dam Construction Plans	196	*
Applications for Discharges into Public Waters	55	10
Applications for U.S. Corps of Engineers Permits	236	41
Applications for State Permits to Dredge or Fill in Coastal Waters	704	127
totals	1,405	178

* Many of these required comment in regard to alternative selection of program design.

Administrative Services

Vital supporting roles are played by the Wildlife Commission's Administrative Services Unit.

A number of vital, supporting services are provided by the 34 employees in Administrative Services. Without the dedicated, competent assistance of these employees in these supportive roles, the major, visible programs of the Wildlife Resources Commission could not properly function. The following information about these important positions and the services they render will serve to acknowledge the work of these sometimes overlooked employees whose contributions are actually indispensable.

DATA PROCESSING The data processing unit is composed of four key punch operators and their supervisor, one data coordinator, one computer programmer, and the systems analyst, who also serves as administrator for the purchasing and warehousing units in addition to duties in supervising the data processing unit. The data processing unit facilitates the collection, manipulation, and presentation of the large quantity of information relating to the wildlife conservation program. A few of the major data management programs are listed below:

License agent account records were maintained for over 1,100 license agents who were consigned over 1,157,000 hunting and fishing licenses of which over 872,000 were sold and accounted for each year of the biennium.

A master file of over 55,000 subscriptions to WILDLIFE IN NORTH CAROLINA was maintained. All motorboat accidents occurring since 1960 and detailed information relating to each were cataloged and stored for future reference in an automated file. Data processing assistance was given to the Division of Game, Inland Fisheries, and Law Enforcement in storing, retrieving, and manipulating the various management and survey information relative to their respective programs.

The management of over 175,000 motorboat registra-

Ken Taylor

Lawrence Burnette and Carol Bridgers of the Wildlife Commission's Purchasing Section consult on the accuracy of a purchase for one of the Commission's divisions.

Wildlife Budget
July 1, 1976 - June 30, 1978
Expenditures

Administration

Administrative Services —
- Finance
- Licensing
- Data Processing
- Interagency Wildlife Coordination
- Purchasing & Warehousing

Protection

Education
Hunter Safety

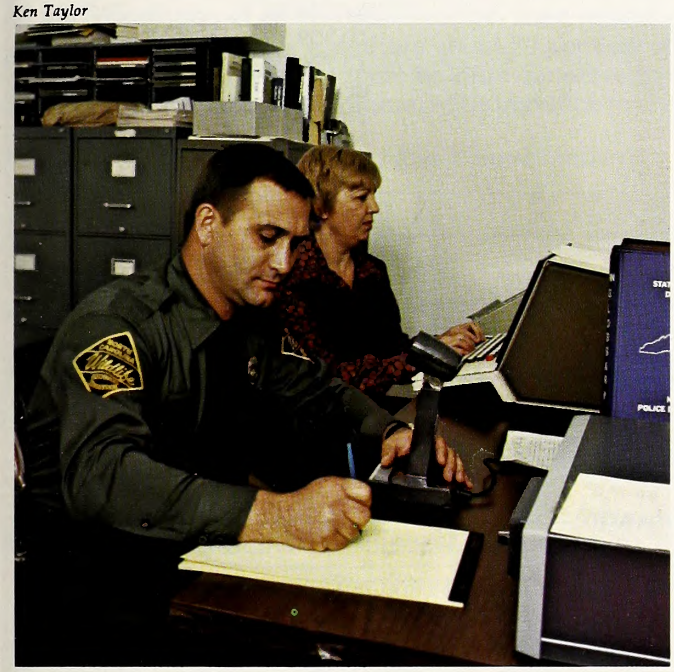
Inland Fisheries — Administration
Inland Fisheries — Production
Inland Fisheries — Management & Research

Game — Administration
Game — Statewide Game Management

Reserves
Transfers
Refund of Receipts & Expenditures

Total Expenditures

Ken Taylor



During the biennium, the Wildlife Commission set up a toll free telephone line which citizens can use to report violations, check regulations or request information on a variety of wildlife related subjects.

1976-77	1977-78
$ 236,646.30	$ 320,748.77
233,297.94	193,812.41
138,926.65	192,937.14
139,548.41	168,034.95
113,850.12	127,037.51
85,388.17	100,418.84
3,714,996.91	3,990,820.70
330,953.63	533,037.04
83,151.22	94,934.07
42,918.42	56,474.62
514,137.03	540,631.27
455,044.84	566,089.82
39,248.24	58,549.10
2,072,224.23	2,289,222.40
200,529.97	308,088.14
71,509.00	276,393.37
732,360.04	436,750.65
$ 9,204,731.12	$10,253,980.80

tions continues to constitute a major portion of the data processing effort. This file is being fully automated and computerized as equipment can be acquired in order to handle this responsibility in the most efficient and economical manner possible.

Budgetary accounting records and reports are provided by the data processing unit in order to meet the various requirements of the State Budget Office and the State Auditor's Office. This important function includes the preparation of about 15,000 checks annually; the preparation of detail and summary ledgers for receipts, encumbrances, and expenditures; the preparation of monthly budget reports for general internal management use and for submission to the State Budget Office; and the preparation of reports on expenditures in approved federal aid projects for reimbursement, audit, and management purposes.

PURCHASING Based upon the recommendation of the State Auditor and working closely with the Division of Purchase and Contract, the Wildlife Resources Commission established a purchasing unit during the biennium in order to more efficiently and economically administer the purchasing functions of the agency. The unit consists of a purchasing officer and a purchasing clerk who work with the Divisions in filling approximately 1,500 requisitions annually to obtain the required equipment, materials, and supplies at the best price available to carry on the fish and wildlife programs of the agency.

WAREHOUSE, MAIL, AND SUPPLY The warehouse manager and stock clerk fill on an annual basis approximately 1,700 requisitions for about 10,000 stock withdrawals and maintain a perpetual inventory of over $120,000 in necessary equipment and supplies.

The storeroom supervisor and mail clerk process about 2,400 requisitions for about 15,000 stock withdrawals of operating supplies each year. In most cases, these orders must be packaged and shipped to field employees. These employees also handle approximately 500,000 pieces of mail annually and must accurately account for over $90,000 in postage meter fees each year.

FINANCE The accounting manager, revenue supervisor, and accounting technician supervisor are responsible for the collection of revenues and the disbursement of expenditures for the Wildlife Resources Commission's $10 million annual budget. To assist them, there are four accounting technicians and two clerks. The Finance Section maintains adequate internal controls and audits to ensure that all Budget Office directives regarding the collection and disbursement of funds are properly administered.

Federal funds totaling over $1.5 million each year are accounted for in compliance with all applicable rules by this unit. Currently the accounting manager and systems analyst are working with the State Auditor's Office to implement the Departmental Accounting System designed to standardize the financial and budgetary data and reports of all agencies.

Administrative Services

License Receipts

	1976-77	1977-78
Hunting & Fishing Licenses	$ 6,610,385.81	$ 6,560,182.70
Bonding — License Agents		2,400.75
Management Area Receipts	320,770.40	344,651.13
Federal Cooperation	1,164,248.59	2,179,344.14
Fish Kill Reimbursement	10,209.32	
Miscellaneous Receipts	13,790.04	24,779.23
Sale of Publications	86,939.01	97,014.39
Sale of Surplus Property	38,705.69	32,096.16
Rent of State Property	7,656.20	8,258.20
Reimbursement from Motorboat Fund	273,222.00	316,015.41
Donations	1,297.00	2,882.00
Refund of Receipts & Expenses	732,360.04	436,750.65
Transferred for Deferred Obligations	144,721.00	71,509.00
Imprest Cash Fund		100.00
Transferred from Capital Improvement		941.37
Total Receipts	$ 9,404,305.10	$10,076,925.13

Hunting Licenses

	1976-77		1977-78	
	Number	Amount	Number	Amount
Resident Combination Hunting & Fishing License	168,501	$1,600,759.50	161,370	$1,533,015.00
Resident County Licenses	59,921	194,743.25	57,865	188,061.25
Resident State Licenses	102,360	716,520.00	99,672	697,704.00
Nonresident Licenses	6,716	164,542.00	6,111	149,719.50
Nonresident 6-Day Licenses	2,402	46,839.00	2,463	48,028.50
Resident State Trapping Licenses	2,267	21,536.50	2,271	21,574.50
Hunting Guide's Licenses	128	608.00	128	608.00
Resident County Trapping Licenses	2,926	13,167.00	2,701	12,154.50
Controlled Shooting Preserve Licenses	376	3,572.00	362	3,439.00
Primitive Weapons Hunting Licenses	4,593	20,668.50	4,944	22,248.00
Resident Sportsman's Hunting, Fishing, Big Game, Game Lands, Bow & Arrow, and Trout Licenses	46,824	1,147,188.00	54,560	1,336,720.00
Nonresident Sportsman's Hunting, Fishing, Big Game, Game Lands, Bow & Arrow, and Trout Licenses	232	11,484.00	777	38,461.50
Nonresident Big Game Hunting Licenses	4,225	19,012.50	3,335	48,357.50
Game Lands Use Permits	38,193	286,447.50	36,829	276,217.50
Resident Big Game Hunting Licenses	133,643	434,339.75	134,177	436,075.25
Miscellaneous Licenses and Permits	1,240	6,840.75	892	7,183.50
Totals	574,547	$4,688,268.25	568,457	$4,819,567.50

Fishing Licenses

	1976		1977	
	Number	Amount	Number	Amount
Resident County Licenses	19,918	$ 64,733.50	18,201	59,153.25
Resident State Licenses	162,480	1,137,360.00	164,009	1,148,063.00
Nonresident State Licenses	14,373	172,476.00	14,224	170,688.00
Resident Special Trout Licenses	45,849	137,547.00	43,655	130,965.00
Nonresident Special Trout Licenses	3,178	18,273.50	3,163	18,187.25
Resident Special Device Personal Use Licenses	10,927	30,049.25	10,373	28,525.75
Nonresident Special Device Personal Use Licenses	41	389.50	33	313.50
Resident Special Device Non-Personal Use Licenses	72	684.00	65	617.50
Nonresident Special Device Non-Personal Use Licenses			2	49.00
Resident 3-Day Licenses	29,760	81,840.00	25,411	69,880.25
Nonresident 3-Day Licenses	26,239	131,195.00	24,698	123,490.00
Totals	312,837	$1,774,547.75	303,834	$1,749,932.50

LICENSE SECTION The revenue supervisor and eight accounting clerks administer the statewide system of license agents who sell hunting and fishing licenses. Each license account must be carefully audited to ensure compliance with all applicable rules relating to the issuance of licenses and remittance of funds. Each license agent must be consigned an adequate supply of each type of license and accurate records must be kept on the disposition of all licenses. Receipts from hunting and fishing license sales constitute about 70 per cent of the agency's revenue to support wildlife conservation activities; so this activity is of utmost importance to the successful administration of the wildlife conservation program.

PERSONNEL The personnel officer and technician are responsible for the preparation of all personnel action forms, payrolls, and all annual salary increment and longevity schedules; the maintenance of all personnel files and records; and the administration of all insurance, retirement, hospitalization, and all other fringe benefits. All of these activities must be acomplished in accordance with agency and state policies, guidelines, and time schedules and with the State Personnel Act.

Summary of Operations (Hunting and Fishing Licenses)

	1976-77	1977-78
Funds transferred from preceding year	$ 2,050,957.30	$ 2,250,531.28
Gross Receipts for year	9,404,305.10	10,076,925.13
Total Available Funds	$11,455,262.40	$12,327,456.41
Less Expenditures	9,204,731.12	10,253,980.80
* Operating Reserve — June 30, 1977	$ 2,250,531.28	
* Operating Reserve — June 30, 1978		$ 2,073,475.61

* This operating reserve is to meet payrolls and other obligations during the months of July, August and September each year when revenue from hunting and fishing license sales is very low.

Motorboat Budget Expenditures July 1, 1976 - June 30, 1978

	1976-77	1977-78
Administration	$ 44,269.23	$ 61,438.68
Boating Safety	124,947.94	126,353.96
Registration	167,075.02	151,319.34
Engineering	392,134.90	352,670.19
Transfers	284,907.00	378,622.41
Refund of Receipts & Expenditures	11,987.76	16,909.74
Total Expenditures	$1,025,321.85	$1,087,314.32

Motorboat Receipts

	1976-77	1977-78
Registration — Boats	$ 560,699.00	$ 420,484.00
Gasoline Tax Refund Allocation	293,249.12	303,398.71
Miscellaneous Receipts	1,885.05	1,010.92
Federal Aid — Boating Safety	196,848.00	60,000.00
Refund of Receipts & Expenditures	11,987.76	16,909.74
Transferred from Prior Year — Deferred Obligations	10,462.00	11,685.00
Reversion from Capital Improvement		4,865.44
Donations		7.00
Imprest Cash Fund		200.00
Total Receipts	$ 1,075,130.93	$ 818,560.81

Summary of Operations (Motorboat Registrations)

	1976-77	1977-78
Transferred from Preceding Year	$ 354,024.39	$ 403,833.47
Gross Receipts for Year	1,075,130.93	818,560.81
Total Available Funds	$ 1,429,155.32	$ 1,222,394.28
Less Expenditures	1,025,321.85	1,087,314.32
* Operating Reserve — June 30, 1977	$ 403,833.47	
* Operating Reserve — June 30, 1978		$ 135,079.96

* The operating reserve is to meet payrolls and all other obligations during the months of July, August, September, October and November each year when revenue from Motorboat registrations is very low.

Ken Taylor

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WILDLIFE IN NORTH CAROLINA

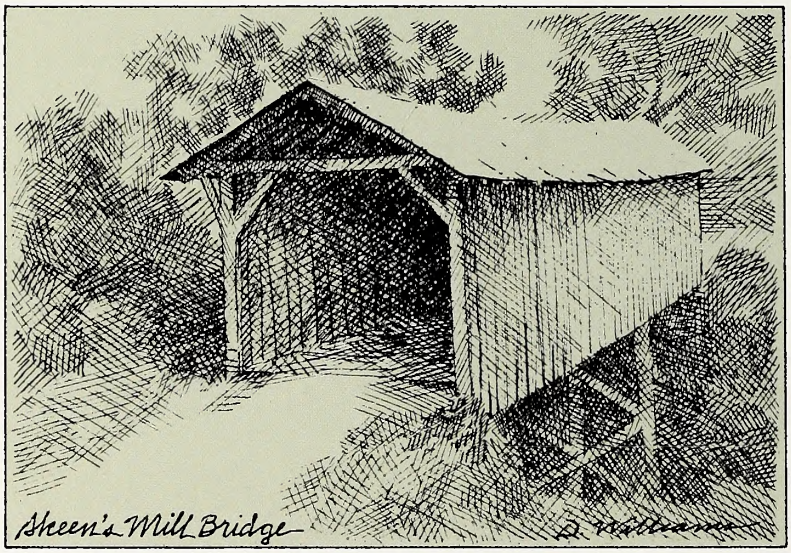
FEBRUARY 1979

by Jim Dean

The Kissing Bridges

Only four covered bridges remain of the hundreds that once spanned rivers and creeks in North Carolina.

"We used to stop the buggy on a covered bridge because nobody could see us in there," the man recalled. "A young fellow was entitled to a kiss when he crossed a bridge. That was part of folklore when I was a kid, and besides, it was a darn good excuse. I hear the same thing goes on in automatic car washes today, but somehow or other it doesn't seem quite so romantic."



Of course, it's too early to predict any future nostalgia for car washes, but the covered bridge has definitely become a part of this nation's heritage. Ironically, the only covered bridges most young folks have ever seen are those painted on calendars. Indeed, one might get the wrong impression that there were never really very many covered bridges.

Actually, they were once quite numerous. At one time, for example, there were 60 such bridges in Randolph County alone, and 43 remained as late as 1937. Today, only two of those Randolph County bridges remain standing; and worse than that, there are only two others in the entire State, one in Catawba County and one in Bertie County.

Some of the bridges were washed away in floods, some burned, others deteriorated over the years until they finally fell in, and some were replaced with more modern structures. As is often the case with items of historical interest — including such things as steam locomotives, clipper ships and even covered bridges — we seek to preserve them only after they're already gone.

To have — at last count — only four covered bridges left in North Carolina is unfortunate, but at least we have these to remind old-timers of stolen kisses.

Although travelers often sought shelter from rain inside such bridges, they were roofed for a practical reason. As one New England saying goes, "Why do women wear petticoats? To protect their underpinning. Why were bridges covered? Likewise." The roofing protected the flooring and purlings from the weather and thus prevented rotting.

Also, from the turn of the century until the 1920's — when many covered bridges were constructed — costs were not great and labor was cheap. A covered bridge might cost anywhere from $1 to $12 a foot. The Pisgah Covered Bridge over Little River near Ulah in Randolph County is 40 feet long and was built in 1920 for a mere $40.

Interestingly enough, Randolph County had more than the usual number of covered bridges. One theory is that Randolph was a progressive county, but a second theory is that local political candidates often competed with each other in pledging to build bridges.

Of the four covered bridges remaining in this State, only three are accessible to sightseers (the fourth is Rascoe Mill bridge in Bertie County, but it is on private land and closed to public access).

For those who might want to visit one of the bridges, the following information is provided:

Bunker Hill Bridge — This bridge spans Lyles Creek about two miles east of Claremont in Catawba County, and is reached by a short, marked foot trail from a roadside park (Connor Park) on U.S. 70. The bridge has been restored and preserved as a historical attraction. Built in 1895 as an open span, the bridge was enclosed around 1900 and used for many years thereafter. The structure is fastened together with wooden pegs and is still sturdy. It is on the old Island Ford Road (closed to motoring) which was a pre-Revolutionary route made by widening an Indian trail connecting the regions which became Kentucky and South Carolina.

Uwharrie River Bridge — About three miles north of U.S. 64, this bridge is reached via secondary roads (1344 or 1408) connecting with U.S. 64 about 8 miles west of Asheboro in Randolph County.

Pisgah Bridge — On west fork of Little River in Randolph County, this bridge is about seven and a half miles southwest of Asheboro, and is reached via secondary road 1114 connecting with U.S. 220 in Ulah. Much of the surrounding area is in Uwharrie National Forest.

WILDLIFE IN NORTH CAROLINA

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This scimitar-horned oryx is one of the attractions already on display at the North Carolina Zoological Park.

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NORTH CAROLINA'S ZOO TAKES SHAPE

Clay Nolen

The largest natural habitat zoo in the world is under construction near Asheboro, and there are already over 200 animals for you to see.

by Rick Estes

"OK. Now straighten it up. Come on back; that's good. Hold it." Les Schobert was giving directions to one of the animal keepers who was backing a small trailer up to a larger one.

The scene was the parking lot at the N.C. Zoo's interim facility near Asheboro. It was a rainy November afternoon. Inside the larger trailer was a rare female Dama gazelle, the second one to arrive at the zoo.

Les is the animal curator at the zoo. He had to make the trailer exchange in the parking lot instead of moving the gazelle directly into her new holding area because of a lack of space inside the compound. Finally, by going through the back door to get to the front door, so to speak, he got the Dama into her new home.

The lack of space is a familiar problem for the staff of the N.C. Zoological Park. Since 1964 when the Raleigh Jaycees donated money for a feasibility study, the idea for a State Zoo for North Carolina has materialized slowly. Funding has come from the General Assembly since 1969, but the amount of the appropriations has varied. Additional funds have come from the N.C. Zoological Society and

This female Siberian tiger (right) was the first animal in North Carolina's new zoo. It was donated by the N.C. Chapter of Distributive Education Clubs of America. The contact area where children and adults can touch certain tame species of wildlife such as this young American bison (left) has been very popular at the interim zoo.

from private foundation grants. With this pattern of financing, the zoo is moving ahead with construction as money becomes available.

The zoo is not completed, but an interim zoo is open and has been receiving visitors since 1974.

What is an interim zoo? What can you expect to see when you go there?

The zoo facility now open to the public is an "in the meantime" zoo. It's open while we wait for the "new zoo" to be finished. However, the interim zoo itself is well worth a visit. Over 200 animals representing some 60 species are exhibited there — colorful animals like the gray wolf, the blue and gold macaw, the olive baboon, and the white-bearded gnu. Some rare and endangered animals are the Siberian tiger, the southern white rhino, and of course, the Dama gazelles.

As we rode through the fenced areas of the temporary zoo on that rainy November afternoon, Cherie Talley told me what happened to the first female Dama.

"Some of our animal keepers found her lying on the ground with a broken back," she said. "When the vet checked her, he could only speculate as to what happened. Apparently she was spooked, maybe by a dog outside the fence. She must have jumped straight up, hit the limb of a tree, and broken her back," Cherie said. "Since then, we have added a second fence outside the original one to keep dogs and other wild animals at a safer distance from some of our animals," she added.

Cherie is the education coordinator at the zoo. Education is one of the four main functions that most zoos serve. In addition to entertainment, conservation, and research, it is an important reason for having a zoo. One of the primary goals of the educational programs at the N.C. Zoo is to present visitors with an ecological approach to environmental education. According to Cherie, the design of the new zoo will help accomplish that objective by showing animals in natural groupings and in something like their native environments.

In the meantime, you can enjoy seeing and learning about some of the world's most interesting animals — like the pair of white rhinos that had their calf, Caroline, at the zoo in 1975. Although 342 white rhinos were in captivity all over the world at the time, only 27 births had been recorded. In the following year, when only 17 tree kangaroos were in zoos anywhere, the pair at Asheboro had a joey, or young kangaroo. Another joey was born in 1978. When it was still in its mother's pouch, it looked like one of those dogs whose heads bob up and down in the rear window of a car.

In fact, successful reproduction of its animals has been one of the zoo's earliest accomplishments. During the first year of operation, 80 percent of the animals that had mates and were old enough to reproduce, did so.

One birth was particularly significant. The first-ever birth in captivity of the endangered African spot-necked otter occurred here. This event brought recognition to the North Carolina Zoo from other zoo keepers and wild animal experts all over the world.

Of course, animals in other zoos have babies, too. And there are certainly many other zoos — famous zoos, like the San Diego Zoo and the St. Louis Zoo. So, what's special about ours?

For one thing, it's only the second State Zoo in the country. The other one is the Minnesota State Zoo. Most are city or private institutions.

Second, the N.C. Zoological Park (the "new zoo") will be a natural habitat zoo. That is, the animals will be exhibited in natural surroundings. Most of the animals will not be seen in cages. Naturally, there will be safety enclosures to protect the people from the animals, and also to protect the animals from the people. But, where possible, lions, tigers and elephants, and other zoo animals will be seen "out in the open."

The barriers will be natural barriers. For example, you will see lions across a moat that is 25 feet wide and 17 feet deep with an overhanging ledge on your side. The animal experts and designers of the natural habitat sections of the zoo know that a lion can't reach you from the other side of the moat! That is why it is called a natural habitat zoo — the animals appear in natural surroundings.

And the natural surroundings the

Jim Page

Clay Nolen

The red-necked ostrich (above) is the largest living bird; and although it is flightless, it can run 40 miles per hour. Contrary to popular belief, ostriches do not bury their heads in sand when frightened. Feeding time is a massive undertaking at the zoo. This truck full of grains (below) will go to a variety of species.

Clay Nolen

animals will be appearing in are beautiful. The zoo property consists of 1,371 acres of rolling hills, valleys, and streams in Randolph County. The land was given to the Zoo Society by a group called Randolph County for Zoological Development in 1971. The site is often referred to as the Purgatory Mountain site after the 927-foot "mountain" that sits near its northern boundary. One of the zoo's publications proclaims that "200 animals now call Purgatory home."

When the new zoo is finished, it will consist of seven geographic areas and cover the entire 1,371 acres (compared to the mere 40 acres now in the interim zoo). Animals representing Africa, North America, Australia, South America, Europe, Asia and a Sea World will be seen in their respective exhibits and habitat areas. Some of these animals will be seen in controlled environmental structures where constant temperature and humidity can be maintained. There will also be a large aviary and an African veldt area where visitors will drive among the animals in special vehicles.

The natural habitat zoo was originally seen as a 20- to 30-year project. This summer, 10 years after the master plan was adopted, the first section is scheduled to open to the public.

The new director of the zoo, Robert Fry, a retired Marine Corps lieutenant colonel, says that things are moving faster now.

"Appropriations from the General Assembly are becoming larger; we have received some private grant money from N.C. foundations, and some assistance from the Federal Government," he said.

"Initially, it was thought that State funds would be used to get the zoo started, and then private contributions would become the major source of revenue to complete construction

Once native to North Carolina, this is one of several American bison at the zoo (above). The Grevy's zebra (right) is the largest of five species of zebras, and this male achieved a measure of fame when a female named "Stripes" was donated to the zoo. Naturally the male was then named "Starzan," and the pair had a baby named — you guessed it — "Forever."

Clay Nolen

Clay Nolen

"Ramar," a lowland gorilla, is presently on loan to the Philadelphia Zoo so that he can meet some other gorillas, especially females. He'll be back when his permanent exhibit area is completed. Many smaller animals in the zoo eat various fruits, and zoo personnel must make a massive "Waldorf" salad every day.

In the wild, this handsome West African crowned crane stomps its feet to disturb insects in the grass, then gobbles them up. Africans often domesticate these birds and keep them in their gardens.

Jim Page

and supply operating expenses," he added. "However, the contributions just have not come in as anticipated."

He also pointed out that, with progress being made on the natural habitat exhibits and with a well-planned campaign to sell the zoo to the public, private support should increase.

The reason for opening an interim zoo in 1975 was to give people a chance to see what had been done and to encourage their participation. With the opening of the zebra, ostrich and giraffe habitat, or ZOG, public interest should increase even more. As more and more people visit the new section, and as other areas are completed, the interim facility will be phased out and animals will be moved into their new natural habitats.

Some of the animals already apparently feel much at home. There is a pair of Sarus cranes that tried for four months to hatch a rock. It seems that the animal dealer who supplied the birds assured zoo personnel that the pair consisted of a male and a female crane. Now, it is impossible to determine the sex of Sarus cranes without a special device for internal inspection. But last spring when the two began building a crude nest on the ground, it appeared that the dealer was right. The only problem was the egg that appeared in the nest was a rock. For several weeks the cranes took turns incubating, turning, and defending their "progeny." Unfortunately, the "egg" never hatched; but at least, the cranes felt at home.

The chance to observe animal behavior, both erratic and normal, is one of the strong points for having a zoo. Much of the research on primates that has been applied to man would have been impossible without zoos and zoo animals. The discovery of the Rh factor in human blood, based on studies with Rhesus monkeys, is a good example. And since most of us can't go to the heart of darkest Africa or the Steppes of Russia to study the world's wildlife, a natural habitat zoo offers a fair compromise.

The North Carolina Zoological Park is a sound addition to the State's cultural, conservation, and educational heritage. It will offer unique opportunities to study animals in ecological groupings and near natural settings. The zoo will give us all a chance to see and appreciate some endangered species that we might otherwise never have.

No zoo is a substitute for a good, basic wildlife program, but a good zoo is a part of the overall scheme of conservation and preservation.

In North Carolina we can have both healthy, viable native wildlife populations and one of the finest representations of international wildlife to be seen anywhere. Each needs your support.

While you're waiting for the "new zoo" to be completed, go see what's already there. Join the N.C. Zoological Society and make a contribution to our State Zoo.

For, as a spokesman for the Zoo Society says, "We're building the largest natural habitat zoo in the world, right here in our State."

Rick Estes is Piedmont field representative for the Division of Information and Education.

A Future For Black Bears?

Research and restoration are helping, but the real problem for North Carolina's bear population is a loss of habitat.

By Curtis Wooten

Jonathan Cullen, an old-time bear hunter from the Mississippi lowlands, was familiar with the Mississippi wilderness and the bears it contained before both were tamed. He grew up with tales of "Old Reel Foot," the infamous bear that outsmarted the best of hunters and made fearless hounds cringe for years. "Old Reel Foot" was the fictional bear "Old Ben" upon which William Faulkner based his classic short story *The Bear*. In *Old Times in the Faulkner Country*, Cullen looked back and lamented, "In Old Reel Foot's days, a man could travel for miles under open timber and never see a road . . . the Carrier Lumber Company or Lamb Fish, a big-time lumberman, cut the timber and sold the land to people who started farming. In 1915 and 1916 near Charleston, Mississippi, there were miles of lumber in stacks high as a man could make them. Now levees and farms have replaced the timber; and where the game was, there are fields of cotton, corn, soybeans and pastures. Even though this is progress and even though it is wise to graze thousands of cattle on land that once produced only a few wild deer, I am sad because this period has come to an end. The day of the bear hunter is over . . . now I think each season is going to be the last one for me."

Though Cullen was talking of Mississippi, he could just as easily have been referring to North Carolina, for it seems that we are headed in that same direction at a steady gait. Piles of logs as high as man's machines could stack them could be seen around Plymouth in northeastern North Carolina in 1975. They were the by-product of the clearing of thousands of acres of former bear habitat for the corporate "superfarms" being developed in the area.

Unlike in Mississippi, bear hunting is not over in North Carolina and the future of our bear population is not a closed book; but both may be in danger if measures cannot be found to slow and counter the increasingly rapid loss of bear habitat across the State.

As was the case in Mississippi and many other southeastern states, the tolling bell for the bear in eastern North Carolina comes in the form of habitat loss. Many of the bays and swamps of the southeastern counties, where only huckleberry and bay bushes grew and bobcats, bears and cottonmouths resided, were practically impenetrable 15 years ago. Only the hardiest of men and dogs ventured there. Many of those same areas are now crisscrossed with drainage canals and roads and there's talk of planting soybeans and converting hardwood forests to pines. In northeastern North Carolina, drainage, clearing and agricultural expansion have crowded the remaining bears into the limited wetlands that remain and bear hunting in most counties in that region is now prohibited.

Ken Taylor

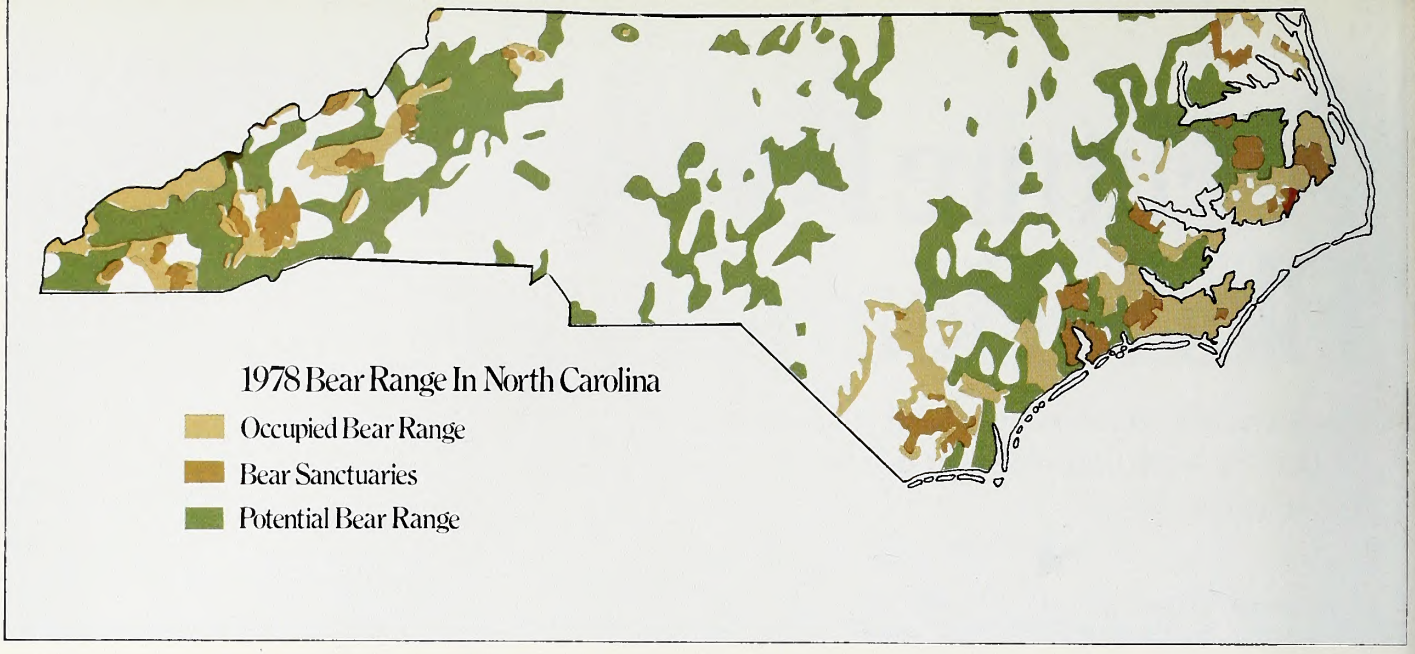
There's little chance of mistaking the track of a bear. The one shown above is probably the impression of the left hind foot since the front foot usually doesn't have a "heel" print. Don't let the jovial pose of the black bear at left deceive you; any bear can be a rough and tough customer.

The bear has its habitat problems in the North Carolina mountains as well, though of a different type and to a lesser degree. In that region road construction, summer home developments, ski resorts and other recreational developments are making serious inroads into what was once prime bear habitat. Interstate 40 now splits an area that was probably the best bear range in western North Carolina — down the Pigeon River Gorge. In contrast to the remote sanctuary it once was, several bears are run over by cars there every summer now.

"Progress?" Many would say yes, but there has to be a place in "progress" for the bear too. Someone has to care for it or the now rare sighting of a bear in the wild will become a thing of the past.

Faulkner implied in *The Bear* that a boy could learn skill, pride, humility and truth through knowledge and understanding of three things: wilderness, bears and hunting. Many today who know the bear, the wilderness and the hunt would agree with him. To lose any one of the three is to lose an irreplaceable part of our natural heritage.

Historically, the bear was found throughout North Carolina. Since the turn of the century, the Piedmont



region has been closely settled, farmed and industrialized. Consequently, the bear has been eliminated from that region for all practical purposes. In more recent years, the bear has been rapidly driven to the more remote and rugged sections of the Coastal and Mountain regions.

By the mid-1960's, biologists with the Wildlife Resources Commission recognized that the bear had a rough row to hoe. They also realized that some answers were going to have to be found if bear populations were to be maintained.

In 1966, biologists took a close look at the bear and its problems. They gathered available information on its status and identified problems and areas where more information was needed. They also developed a list of recommendations for the management of the bear population based on the information they had at hand.

At that time, the North Carolina bear population was estimated to be around 2,200 animals. They were found in 52 counties, but their populations were increasing in only three of those counties. Bears were being killed faster than they could reproduce themselves and approximately one third of all bears harvested were being taken outside the established hunting season.

As part of that study, several problems and reasons for the bear's decline were identified. As might be expected, the major problem identified was that bear habitat was being destroyed at an alarming rate. They also found that "over-zealous protection against crop depredation" was taking a great toll. Furthermore, previously inaccessible areas were being opened with roads which made the bear more accessible.

It was also felt that bear seasons and bag limits were perhaps too liberal and many local laws existed which allowed the taking of bears outside the regulated hunting season.

The biologists doing the study subsequently made several short and long-range recommendations for the management of the North Carolina black bear population. Those recommendations were that no hunting of bears be allowed except during the regulated hunting season, that the bag limit be reduced and that a mandatory tagging and reporting system be established to provide better information on the bear harvest in the State. They also recommended that a system of bear sanctuaries be established across the State to protect against overharvest and urged that wilderness be preserved. Some of the recommendations were far-reaching and most have since been put into effect.

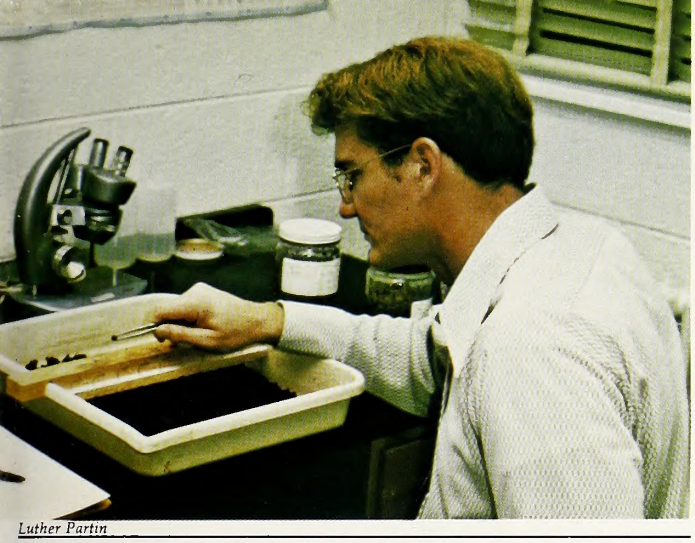
Since the late 1960's, considerable research has been done on the bear in North Carolina in an effort to fill the gaps in available information on the species here. Information has been compiled on basic bear biology, specific habitat needs, home range patterns, seasonal food habits and denning requirements. A system of bear sanctuaries encompassing nearly a million acres was established across the State in 1971. After six years, these are now being evaluated to determine if they are working as expected.

Existing bear hunting practices have been evaluated as have season lengths, opening dates and bag limits. Hunters have cooperated with the studies by providing biological specimens and harvest information from the bears they take, a most important contribution to the conservation of their sport.

North Carolina is currently cooperating with the states of Georgia and Tennessee in studying the mountain black bear population. Bears in that region travel freely into and across all three states, paying no heed to state lines. Those working with the bear in all three states are pooling information and coordinating studies in order to avoid a duplication of effort. They plan to come up with a comprehensive management plan for the bear in the Southern Appalachian Region.

All this study of the black bear is not an end in itself. Rather, it has provided a sound basis for needed changes in the bear hunting season. It has also provided information to support long-range management plans for the bear.

John Collins, a Wildlife Resources Commission biologist from Morganton, is North Carolina's principal black bear investigator. He's the primary one who compiles and analyzes bear data collected by biologists across the State. He keeps track of such things as the total bear mortality by county, average age, weights, sex and reproductive history of bears taken by hunters



Luther Partin

The detailed examination of bear droppings is helpful in determining the animal's food habits since bits of grass fibers, fruit seeds and nut shells can be identified by trained biologists.

and from various other sources. He also compiles information on food availability from year to year and notes habitat losses. One result of this increased information is that the opening date for the bear hunting season in eastern North Carolina was delayed by two weeks starting in 1976. Rather than the traditional mid-October opening date, the season opened in early November. Why? The analysis of several previous years' harvest information had shown that, by delaying the opening date of the hunting season in the Coastal region by two weeks, a significant reduction in the kill of female bears could be expected. That would allow a greater carry-over of females to the next year and greatly increase the reproductive capability of the population.

The analysis of 1976 harvest date revealed that the delayed opening date of the season had the desired effect. There was an 18 percent reduction in the number of females taken by hunters that year on the coast. Analysis of mountain bear harvest data shows that the same phenomenon occurs there as well, but to a lesser degree.

Modern technology and the computer age have joined modern wildlife management — including management for bears. Much of the information on habitat needs and home range of the bear gathered in recent years has been made possible by radio transmitting collars which have been placed on bears and lightweight receivers which allow them to be located in the field with relative ease, day or night.

Collins is now using computers to analyze bear harvest data to make sure more bears aren't being harvested than nature is producing. In North Carolina, we've had an average bear harvest of 230 animals per year for several years. Using a computer population model, information on the annual harvest, age, sex and reproductive rate of bears and a few other factors, Collins found that our statewide bear population is now somewhere between 1,500 and 2,000 animals, including those found in the various state and national parks. About half of these are found in the Coastal region and the other half are found in the mountains.

That's not a tremendous number of animals as compared to many other wildlife species and you might wonder if bear hunting should be allowed at all under the circumstances. But you have to keep in mind that the bear is a top-level carnivore which requires large acreages of wilderness-like habitat to do well. At least 5,000 acres of such habitat is required to support a family group in most cases. As with other wildlife species that are at the top of the food chain — such as the cougar, eagle or wolf — it is not the nature of bears to become thickly populated. Only a limited number will live in a given area and any surplus that is added to the population is forced into marginal areas. Once this happens, they have to compete with man for living space and it isn't often that the bear comes out on top when engaged in such competition.

Collins says that as long as the average age of the bear population is maintained, especially in the female segment, and the harvest remains stable, there is little danger of a sudden significant decline in the bear population. Unlike most other species of wildlife, a female bear does not start reproduction until she is three and a half years old. "We have to maintain a stable female population at or above the reproductive age or we're in trouble," says Collins. "We can stand some dips in the average age but not a steady decline. That's the reason we need to continue to collect harvest data from hunters. And it's the reason that it's so important that hunters work with us to provide biological specimens from harvested bears and by reporting their harvest to wildlife cooperator agents. We're not going to stay in business long if the average age of harvested females goes below the age at which they begin reproduction."

Bears are solitary creatures which do best in areas with minimal potential contact with man. In managing areas for them, this fact is kept in mind. "We need to hold road construction to a minimum in the better bear areas," says Collins. "Also, we need to locate and preserve key mast-producing areas such as stands of oak and hickory, and grape slicks."

In the mountains, these are the primary fall and winter foods of the bear. To a large extent, bears depend on these foods in order to accumulate winter fat. In the Coastal region, bears are more dependent on oak and black gum for winter fat, and they utilize corn left in the fields rather extensively when it's available. Also, the U.S. Forest Service and other landowners are urged to leave large, dead snags and hollow trees as denning sites for the bear and other wildlife.

Collins is not overly pessimistic about the future of the bear in North Carolina, at least in the mountains. He feels that the vast U.S. Forest Service and other government lands in that region can support a viable bear population indefinitely if properly managed. For the Coastal bear population, the outlook is not so promising. "If bear habitat on the coast is destroyed at the same rate as in the past 15 years, the outlook for the bear population in that region is not good," Collins says.

In 1961, Jonathan Cullen mourned the loss of the bear and its habitat in Mississippi. At that time it was all he could do. We haven't reached that point in North Carolina yet. Both our coastal and mountain bear populations can be maintained, but we're going to have to re-examine our definition of "progress" if it is to be done.

Curtis Wooten is western field representative for the Division of Information and Education and a frequent contributor to WILDLIFE IN NORTH CAROLINA.

Karl Maslowski

The Dead Of Winter

In winter's chill ebb, death is a way of life.

By Paul Koepke

"Watch it, boy! They've got a fix on you."

There was another low, irregular series of hoots from the female great horned owl in the post oak a hundred feet to the east and a higher-pitched reply from the male nearby, but neither my remark nor the ominous signals from the owls seemed to disturb the blasé rabbit. It had long since accepted me as a harmless domestic biped and went on nibbling whatever it had found in the rime-stiff grass under the bright mercury-vapor night light.

Suppressing a shiver in that biting January dawn, I hunched my warm coat collar closer to the nape of my neck and resumed my stiff-legged stumping down the causeway to retrieve the morning paper. Seeing me move, the rabbit decided to call it quits for the night and loped leisurely off to disappear in a patch of ivy near the big juniper. The owls, their quarry gone, fell silent.

The rabbit was the last of three who had cavorted and lollygagged around our place during the past summer and autumn. One had fallen victim to a passing vehicle and I found the other dead by a pyracanthus with a dime-sized warble fly hole in its left flank. As for the survivor, it appeared that its number was up as well, particularly if it persisted in feeding in a brightly illuminated patch of open lawn with great horned owls in the offing.

But the owls never got a second chance. I found the rabbit under a chestnut tree the following morning, neatly decapitated, the top of its skull trepanned with surgical precision, and the brains consumed. This was weasel work. That savage but

Karl Maslowski

Hawks are some of Nature's most efficient predators. What often seems cruel to us is simply a way of life to all predators. Killing and eating must go on daily, and little goes to waste. The sharp-shinned hawk (upper left) is a small hawk with extreme quickness and maneuverability. Its diet is mostly small birds, insects and small mammals. Its reputation as a "chicken hawk" isn't borne out by studies, although this slender hawk will take poultry on occasion. The red-tailed hawk (left) is a large hawk with a wingspread of almost five feet. As is the case with most predators, it is beneficial in that it helps hold down the mouse and small rodent population. The red-tail is a fierce competitor and seldom gives up a chase. It and all of its hawk relatives are fully protected by law.

Leonard Lee Rue, III

At the center of many controversies over the years, the foxes are valued members of the wildlife world. Excellent hearing, sharp eyes, quick reflexes, cunning and determination make them efficient predators. The grey fox (above) prefers mice, while the red fox (below) seems to favor rabbits for the bulk of its diet. Both will catch most small mammals and an occasional bird. The grey is an excellent climber and often takes to the trees when pursued by dogs. Instances of either the red or grey damaging healthy wildlife populations are very rare.

Leonard Lee Rue, III

meticulous killer goes straight for the neck, drinks the blood, eats the brains; and, unlike owls or other predators, leaves not so much as an unattached tuft of fur or a spot of gore behind.

The heart of winter is a bitter, bleak, uncharitable place for warm-blooded, wild creatures. Most of the seeds and green growth are gone, the ponds are frozen, and the earth iron-hard. Now, under the lash of necessity, predators are forced to even greater efforts and their victims to hunger-driven heedlessness. The kingfisher, barred from the pond surface by a sheet of ice, must now seek out the shallow, spring-fed rills of moving water and make do with what little it can find. The great blue heron, on the other hand, is more resourceful. I was dumbfounded, one cold winter day, to see a big gawky spindle-shanks attempt a landing 30 feet outside our front window on our ice-locked pond. "No, no! It's slippery, you fool. Come down on land or you'll crash in flames," I muttered to myself, only to have the heron come to rest on the glassy surface as gently as a wisp of thistledown and begin its stately promenade along the dam.

I considered this an exercise in utter futility, for the heron did not have a prayer of catching a fish through two inches of ice. But once again I was wrong, for it was not concerned with the glazed pond surface but rather was eyeballing the ivy-covered dam face with close attention. Suddenly it stopped and slowly extended its neck until, with a sudden thrust and withdrawal, it extracted a

Leonard Lee Rue, III

A mink (right) is rarely seen in nature except by the trapper or the outdoorsman. It is a secretive animal, often using its cunning and slyness to outwit its prey. It is a powerful animal for its size, however, and can catch and kill rats, mice, fish and now and then, poultry. The mink kills only that which it needs for itself or its family. A close relative of the mink, the long-tailed weasel (upper right), is an agile, courageous predator, often tackling prey twice its size. Its reputation as a wanton killer is unfounded, but it will become a terror in defense of its young. The weasel's quickness is almost unbelievable and it can run down rabbits. During the winter, over much of its range, it is pure white except for the tip of its tail.

Karl Maslowski

small, dark, struggling form which was vigorously shaken before it began its last dark journey down that long gullet. It was then that I remembered; voles winter over in the ivy. That heron had a viable plan from the outset and there would be at least one less rodent in my garden next spring.

With the advent of autumn, the red-tailed, red-shouldered, sharp-shinned and marsh hawks return to our immediate area and their appearance is heralded by the ubiquitous blue jays who voice a cry imitating the "kee-you" of the red-shouldered hawk.

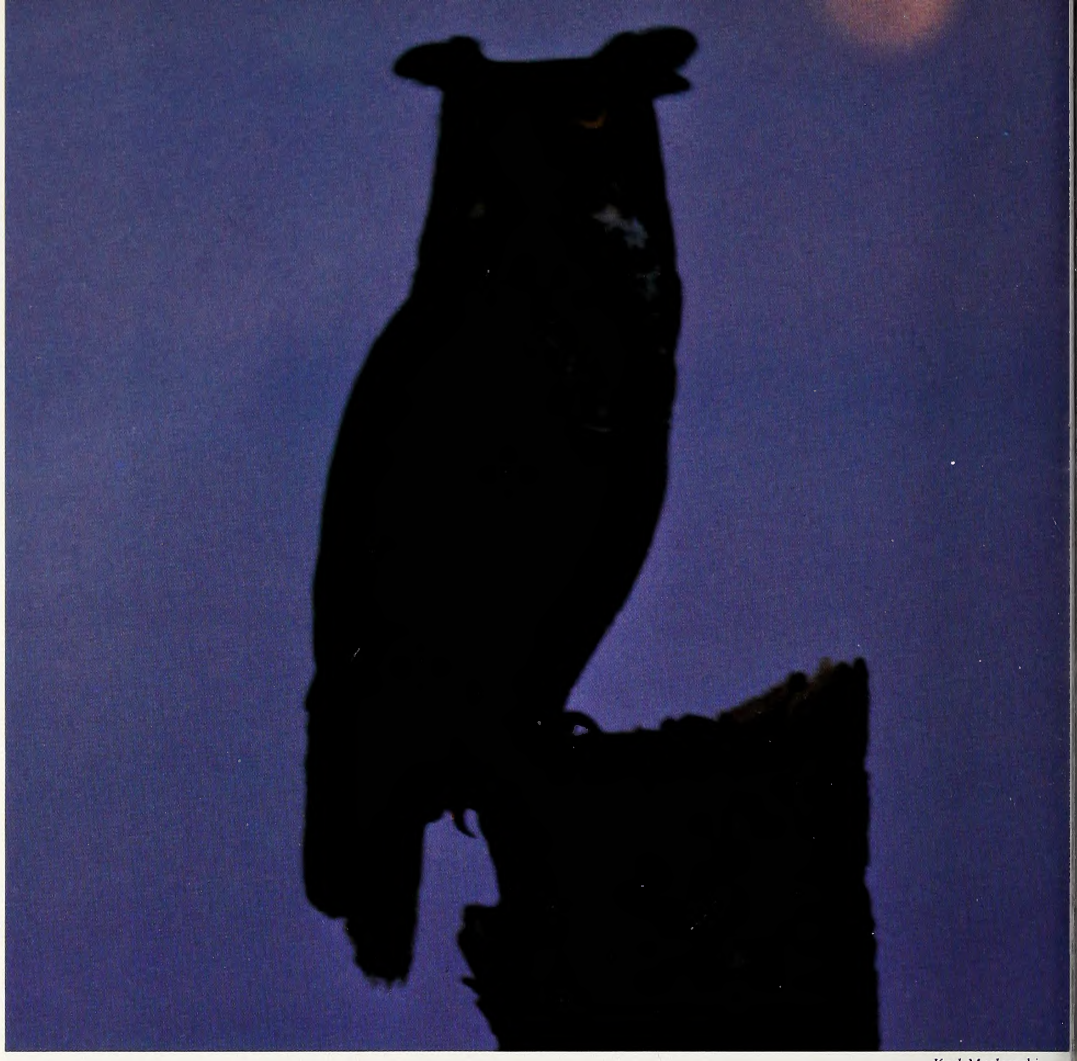
But why warn of the red-shouldered hawk, whose diet, like those of the marsh and red-tailed hawks, consists mainly of rodents, reptiles, and amphibians, rather than sound the call of that swift and deadly scourge of the songbirds at our feeder, the sharp-shin? It may be that "kee-you" is more frequently heard or easier to imitate, but at all events it is blue jayese for "hawk."

But even the sharp-eyed but gluttonous jays can be caught napping now and then and often, as I sit at the kitchen picture window warming my palms with a cup of hot coffee, dozens of birds at the feeder will suddenly disappear as though expunged by a huge eraser. Then I have only to stoop and squint under the awning overhang to see a sharp-shin or two in a nearby tree looking for stragglers and biding their time. On other occasions this small accipiter will thread its way swiftly through the orchard-size trees to slash like a scimitar through the feeding area and even press, full tilt with talons at the ready, into the bare, pliable branches of a bush where a straggler has taken refuge.

One winter afternoon we were alerted by a jarring thud from the kitchen and rushed to the picture window to find a sharp-shin lying stunned in the grass beneath it. It might have been suckered into an awkward maneuver by a smaller, more agile bird and wound up crashing into a sheet of glass which reflected the open field to its rear. As our forms impinged on its addled wits, it pulled itself together and took off, leaving behind on the glass the dusty, cruciform image of its head, neck, breast, and wings as evidence of its incautious foray.

A sharpie's swiftness is exceeded only by its tenacity. We have seen one come to rest on an abelia hedge and peer down intently through the twigs for suspected prey and, still unconvinced, descend to the ground to scrutinize the lower branches more carefully. As a matter of fact, its ability to hunt on

Owls may be the ultimate predators. They have specially feathered wings that are silent in flight, as well as, large, light-sensitive eyes for excellent night vision, keen ears for detection of the slightest rustle in the grass, and wide spreading feet with needle-sharp talons. The barn owl (below) is often called "Nature's flying mouse trap," and can do away with a dozen or more a night. Ounce for ounce, the strongest, most fierce predator in all the animal world is the great horned owl. Few creatures twice its size are any match for this bird. Known to pounce on and subdue full-grown skunks and large tomcats, the great horned owl hunts mostly at dusk and into the night, but its sight is good during daylight hours also; and when food is short and its family is hungry, this owl will continue its search much of the day.



Karl Maslowski

Karl Maslowski

foot seems, at this writing, to have gone largely unnoticed and yet it appears to be one of the bird's most successful ploys. In one instance a sweeping attack scattered the feeding birds, one of which took shelter in the low meadow grass. To my surprise, the hawk landed a short distance away and began slowly quartering the area on foot. When its prey broke cover the sharp-shin took off; and with a furious burst of speed, made the kill after traversing only 30 feet. Obviously, persistence and speed make a lethal combination.

A less fortunate predator, a gray fox, first came to my attention when I sighted it one night in silhouette against the night light as it trotted down the causeway and melted as silently as its own shadow into the adjacent ravine. I spotted it again a few mornings later as it came pelting down a ditch, pursuer or pursued, to vanish in a thicket. When it appeared again it was a headless, drawn, flayed carcass draped over a roadside fence post. The head, fur, and tail had undoubtedly gone to a taxidermist and the display was intended as a warning to other foxes to mend their thievish ways, but I suspect, since a chicken or a suckling pig still disappears now and then, that it deterred the foxes no more effectively than a human head on a pike inhibited the pirates and brigands in humanity's recent past.

And so the endless round of birth, predation, and death continues; and in response to the age-old question, "Is Nature cruel?" one need only glance at the morning paper and ask, "Compared to what?"

Tar Heel Endangered Species Being Studied

Alligators, brown pelicans, red-cockaded woodpeckers and Neuse River waterdogs are just a few of the species which will be the focus of the N.C. Wildlife Resources Commission's endangered species program in 1979.

"We received $555,318 from the U.S. Fish and Wildlife Service for our endangered species program this year," said Frank Barick, chief of the Commission's Interagency Coordination Section which oversees the program. "We have five studies scheduled on endangered species in North Carolina being done by various agencies as part of our program."

The first study is on the American alligator. Researchers are distributing questionnaires to wildlife enforcement officers and biologists throughout eastern North Carolina to determine where the animals are found and what their range is. Another part of the study is being done on Lake Ellis Simon where biologists from N.C. State University are studying the life habits of alligators. Alligators are captured, measured, weighed, and their stomaches are pumped to find out what they've been eating. Then the animals are released unharmed.

The red-cockaded woodpecker is also being studied. Researchers from the N.C. State Agricultural Experiment Station are studying the distribution of the birds in the State and are trying to find out if existing colonies are expanding or declining. Red-cockaded woodpeckers are found primarily in open pine forests of the Sandhills region and other longleaf or pond pine sites. One major threat to the species is short rotation timber cuttings in pine. The birds need mature trees for nesting sites.

The brown pelican is also being studied by the University of North Carolina at Wilmington. These birds breed on two small islands off the North Carolina coast, and researchers are studying the bird's population and breeding biology. Birds will be banded, and records will be kept of their reproductive rate. Brown pelican populations declined drastically during the 1950's and early 1960's due to pesticide build-ups in fish, their primary food.

Ken Taylor

The brown pelican is just one of the animals that will be the focus of studies under the N.C. Wildlife Resources Commission's endangered species program for 1979. Brown pelican populations plummeted in the late 1950's and 1960's due to pesticide poisoning, but the birds now appear to be making a slight comeback.

The Neuse River water dog will also be the object of a study designed to determine its distribution and habits. A radioactive cobalt tag will be attached and movements will be tracked by electronic devices similar to Geiger counters. These animals are nocturnal, unobtrusive and very hard to observe. Their breeding and life habits will be observed in the field and in laboratories.

A study on the population status of the bobcat and otter is also underway. These animals are not endangered, but the Federal Government has placed limits on the exportation of their pelts because the growing foreign market for their furs could conceivably deplete the United States population.

A fur study is also under way. Trappers will tag furs to certify that the animal was taken in North Carolina and show when the animal was trapped. Carcasses of animals will also be checked to determine the age, growth rate, diet, longevity and other factors. Track counts will also be taken at scent stations in 12 Tar Heel counties to attempt to determine the population trends of the animals. Some animals will be equipped with radio telemetry devices so biologists can study their movements and determine the home range of the animals. Aerial photos taken from satellites will also be analyzed to determine the amount of prime bobcat and otter habitat statewide.

A study is also being made on three small species of fish found only in Lake Waccamaw. The study will identify the special habitat needs of these fish, and will determine if the water quality in Lake Waccamaw is declining to the detriment of their population. Several species of mollusks found in Lake Waccamaw will also be studied to determine their distribution. Scientists fear that an exotic mollusk, the Asiatic clam, may be replacing the native mollusks found only in Lake Waccamaw.

The Commission has also decided to manage areas on the Sandhills Game Lands and on the Goose Creek Game Lands for the red-cockaded woodpecker. This will require going to a 100-year cutting rotation on pine to ensure that the birds have the mature forest cover that they need. The locations of the colonies also are being determined, and population estimates for these areas are being made.

– Mark Taylor

Winter Wildlife Food Plentiful

Sportsmen reported seeing more acorns than ever in the woods last fall, and biologists agree that the acorn crop was very heavy. What effects will this have on wildlife populations? According to biologists, there are several species that should be living pretty high off the hog this winter.

"Squirrels, deer, wild turkey, black bears and quail are just a few of the animals that depend on acorns for food to some extent," said George Smith, assistant chief of the Commission's Division of Game. "And with the acorn crop being as heavy as it is, there should be plenty of food available for wildlife for the rest of the winter. Acorns, and other mast items, are especially good food for wildlife because they are a high energy item."

Squirrel hunters should be especially pleased. A healthy acorn crop will play a big role in bringing squirrels through the winter in good shape. And when squirrels are well fed, litters are larger. Squirrels have two litters per year in good years, one in late March and one during the summer. If they are in poor condition, they often will not have a spring litter.

Deer are affected the same way. If a doe comes through the winter in good condition, she will often bear twins. If she comes through undernourished, she will usually bear only one fawn.

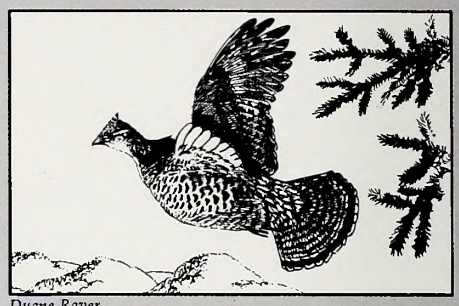
"Deer are heavily dependent upon mast crops in some parts of the State," said Smith. "So in areas where there is a lot of mast, they shouldn't be lacking for food."

Acorn crops vary from year to year depending upon a number of factors. One factor is early and late frosts that may kill the acorns as they first flower. Favorable weather conditions were probably responsible for producing the heavy acorn crop this past year.

Luther Partin

Last fall's heavy acorn crop should help many wildlife species make it through the winter in good shape, according to wildlife biologists. The squirrel, deer and wild turkey are particularly dependent upon mast crops for food. Good nourishment through the harsh months of winter not only affects the individual animal's health, it also helps determine the animal's breeding success in the spring.

Ruffed Grouse Society Formed



Duane Raver

A chapter of the Ruffed Grouse Society was recently formed in North Carolina.

"We are primarily concerned with improving the environment for ruffed grouse, woodcock and other forest wildlife through the maintenance, improvement and expansion of their habitat," said Eddie Jordan, president of the fledgling Tar Heel chapter.

According to Jordan, there are currently 43 members in the North Carolina chapter. For more information, contact Eddie Jordan, Rte. 13, Box 198-A, Salisbury, N.C. 28144.

September Enforcement Report

For the month of September, 1978, the N.C. Wildlife Resources Commission checked a total of 28,573 hunters and fishermen and 4,131 boaters.

Of the hunters and fishermen, 844 were prosecuted and 754 convictions were obtained. The total fines collected were $4,402 and the total costs collected were $18,303.

Of the boaters, 596 prosecutions were made and 517 convictions were obtained. Total fines collected were $1,165 and total costs collected were $12,659.

Other prosecutions totaled 29 and convictions totaled 27. Total fines collected were $1,050 and total costs collected were $650.

All fines and any arrests or witness fees were paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected were paid to the N.C. Wildlife Resources Commission or its personnel.

"Save The Eno" Calendars Available

Before North Carolina was settled by white men, three tribes lived in the Eno River area. They were the Sioux, the Algonquin, and the Tuscarora. The tribe that gave the river its name, the Eno Indian, were a mixture of Algonquin and Sioux stock.

The 1979 Eno River calendar is now for sale. This year the calendar features the Indian lore of the Eno River, and includes photographs, anecdotes, and pen and ink drawings by Jenny Nygard.

The calendar is $3.50 per copy and is available from Carol Schueler, 521 Brockwood Drive, Durham, N.C. 27707. The calendar is published annually by the Eno River Association, a citizens group that is dedicated to the preservation of the Eno River.

Merry Oaks Game Lands Expanded

The N.C. Wildlife Resources Commission's game lands program has a new addition. A 1,500 acre tract in Lee and Chatham counties was recently acquired and has become a part of the Merry Oaks Game Land.

The section was leased from the Carolina Power and Light Company and will be managed jointly under a cooperative agreement between the power company and the Wildlife Commission.

Earl Gillis, wildlife biologist from Sanford, described the tract's wildlife potential.

"There is excellent small game habitat in this area. Squirrel, rabbit, quail, wood duck and dove hunting should be very good here," he said.

Gillis also pointed out that beaver, otter and muskrats can be seen along the streams and canals that cross the area.

The game land extends southeast along the Cape Fear River from a point just below the merging of the Deep and Haw rivers to a point near Avents Ferry.

There are almost two million acres in the Wildlife Commission's game lands program statewide.

Carolina Conservationist Lithographs Available

The third in a series of limited edition lithographs has been issued by the N.C. Wildlife Resources Commission in connection with its Carolina Conservationist program. The lithograph is a painting by Pete Turner, picturing seven species of wildlife that once lived in North Carolina, but which are now extinct here or have recently returned. The painting was published in the July, 1978, issue of WILDLIFE IN NORTH CAROLINA and features the timber wolf, passenger pigeon, Carolina parakeet, elk, beaver, cougar and buffalo (beavers and cougars are again inhabitants of the State).

For a contribution of $25 or more, you will receive a 16 by 20 inch full color, limited edition (1,000 copies made), signed and numbered lithograph on heavy, high-quality paper. A leaflet will accompany the lithograph, describing the species in the print. Prints that are signed only are $10.

The first two prints done for the Carolina Conservationist program are also available. The first was done in 1975 and featured the rare, red-cockaded woodpecker. The second, done in 1977, features the brown pelican. Limited edition signed and numbered prints in both of these series also cost $25, while prints that are just signed are $10.

The Carolina Conservationist program gives nonsportsmen a means to contribute to wildlife conservation of nongame species. All monies raised through this program are used for the conservation, study and protection of nongame animals.

Prints are available from the N.C. Wildlife Resources Commission, Division of Information and Education, 512 N. Salisbury Street, Archdale Bldg., Raleigh, North Carolina 27611. Checks or money orders should be made payable to the N.C. Wildlife Resources Commission.

Give Us A Hand!

Readers will find a small postal card with a few questions on the back enclosed in this issue of WILDLIFE IN NORTH CAROLINA.

We are conducting this readership survey to find out how we can serve you better. This information will be tabulated and used as a guideline for planning the content of future issues of WILDLIFE IN NORTH CAROLINA.

The postage is paid, so all you have to do is tear out the questionnaire, answer the questions and drop it in the mail. It's not much trouble for you and will be a big help to us.

Wildlife Stamps Now On Sale

Some of the most colorful and interesting U.S. postage stamps have various species of wildlife on them. An issue of four stamps last fall depicted four species of American owls, and the Raleigh Stamp Club selected the great horned owl stamp to place on a special envelope called a cachet (pronounced ca-shay). This envelope was imprinted with a great horned owl illustration by Duane Raver, the original of which is owned by the N.C. Wildlife Federation.

This cachet with a Raleigh postmark of the Research Triangle Stamp Show in October is available from the Raleigh Stamp Club, P.O. Box 26863 for 65 cents as long as supplies last. Send the proper amount along with a stamped self-addressed envelope to the above address.

Ken Taylor

The National Rifle Association recently honored the N.C. Wildlife Resources Commission for graduating over 100,000 students from the Commission's hunter safety training programs. According to C.J. Overton, director of the hunter safety program and chief of the Commission's Division of Enforcement, over 120,000 students have graduated from hunter safety programs in North Carolina. Here, Edward Land, a field representative for the NRA, presents Overton a plaque commemorating the achievement.

Gobblers Lead A Tough Life

A recent study of restocked wild turkeys in western North Carolina has shown that the birds have large ranges and often suffer heavy mortality among the young, according to biologists with the N.C. Wildlife Resources Commission.

During the winter of 1978, 10 wild turkeys trapped in the Piedmont and nine turkeys trapped in the mountains were released in the South Mountains State Park for study. Each bird was equipped with a portable solar-powered radio transmitter and biologists have been keeping track of the birds since. Efforts were made to monitor the birds twice a week to learn about their movements and mortalities. Hens were very closely monitored to determine nesting success, and later on, to determine poult survival.

"The monitoring has shown that the range of the birds is quite large," said Jim Bowman, a wildlife biologist from Marion. "Spring ranges for three hens averaged 7,914 acres while the summer ranges of the same hens averaged 2,078 acres. The ranges of the remaining turkeys are still being studied."

The wily birds also seem inclined to travel considerable distances from their site of release. Two of the hens nested about 6 1/2 miles from where they were released, while another hen nested eight miles from the release site. One transmitter from a worldly gobbler was recovered over eight miles from the release site.

Six of the hens released nested, and three birds successfully hatched a total of 17 poults. Due to predation, exposure, and other factors only one poult is still alive. Three birds attempted to nest but were unsuccessful due to predation and infertile clutches of eggs.

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Nature's Ways

Nature's Deep Sleep

written and illustrated by Duane Raber

You may remember the cartoon showing a sleepy-eyed bear peering out of its rocky den with ol' bruin saying, "My goodness! I've over-slept; it's half past April!" Of course, most people believe all bears along with raccoons, possums, mice and lots of others sleep soundly all winter. Actually, that's not so! Several wildlife species are thought to undergo nature's deep sleep called hibernation; but in our fairly mild latitudes, they do not hibernate in the true sense of the word.

Many wild animals do spend varying amounts of time slumbering in a semi-dormant state during the coldest parts of the year. The colder the weather, the longer these "naps"; and in more northern sections of the country, this may be as long as four or five months.

Let's take bears as an example of the critters which do go into nature's slumber for at least short periods during the winter. They seem to sense that cold weather is on the way, and then eat enough to take care of weeks of no food intake. Also they scrape a den of sorts for some protection from the cold weather. Again, where the winters are severe, the dens are more elaborate.

Animal metabolism during this "hibernation" is considerably different from normal body functions. The heart rate drops drastically, the respiration is much less, the stored fat is absorbed, and the waste products are no longer produced. All of life's processes are slowed to a minimum.

Similar shorter or longer "naps" are characteristic of raccoons, possums, and even squirrels. Further up the ladder toward true hiberation are the groundhog, most bats, and the closest to a real hibernator in our latitude, the chipmunk. In the case of the chipmunk, the body temperature drops drastically, and sleep is often so sound that the little critters can scarcely be aroused; they may appear to be almost dead. In some unusual cases, the deep sleeping chipmunks are frozen to death when they have miscalculated the winter and haven't burrowed deeply enough far below the frost line.

Few, if any, birds approach any sort of hibernation since they must maintain a very high body temperature and thus must continue their search for food the year-round. Some migrate to warmer climates to find food and suitable temperatures.

The groundhog? He certainly doesn't venture forth until February on his appointed day. And like the bear in the cartoon, even he may oversleep!

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The scimitar-horned oryx is a native of the semi-desert fringes of the Sahara in Africa, but you can also see them at the N.C. Zoological Park near Asheboro.

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WILDLIFE IN NORTH CAROLINA

MARCH 1979

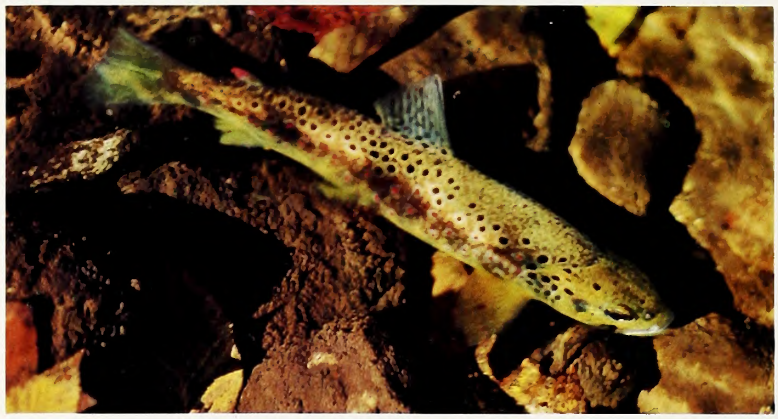
MAR 9 1979

by Jim Dean

Our Alien Wildlife

North Carolina is home to many wildlife species which are not native to the state, and some of these "immigrants" are pests.

Curtis Wooten



The brown trout is one of North Carolina's most beautiful and popular non-native wildlife species. Browns are originally from Europe, and were first stocked in our mountain streams around the turn of the century.

Did it ever occur to you that you might run over a catfish one day while driving to work? Have you ever considered the possibility that birds could lower the value of your home? Would it bother you if the trees in your yard had no leaves this summer?

These are admittedly strange questions, but they're hardly beyond the realm of possibility. In each case, the potential exists because man has misused his power to manipulate various wildlife species.

The fact is that North Carolina is home to a lot of wildlife species (both aquatic and terrestrial) which are not native to the State. These species are immigrants — or "exotics" as professional wildlife managers call them.

Many of these species have no significant adverse impact, and others have proven very popular and beneficial, but that's not true of all of them. A listing of the exotics which now call North Carolina home would include starlings, carp, wild boar, brown and rainbow trout, fire ants, Asiatic clams, shellcrackers (redear sunfish), English sparrows, and many other species.

Rainbow and brown trout, as well as shellcrackers, have been here so long and are so firmly established that many people do not even realize that these popular sport fish are exotics. Actually rainbow trout are native to this nation's west, while brown trout are native to Europe. Both were first stocked in North Carolina late in the last century. Shellcrackers were introduced from states farther south.

Some might argue that the introduction of rainbow and brown trout hastened the decline of the native speckles or brook trout (actually, they are char, not trout); but had these exotics not been stocked here, chances are that brook trout populations would have declined drastically anyway. Brookies are simply not as tolerant of pollution and other habitat changes; and without rainbows and browns, we would not have the excellent trout fishing we now enjoy.

With few exceptions, most of the troublesome exotic species were either introduced to North Carolina by accident or by misguided amateur wildlifers. For example, starlings, English sparrows and carp were imported many years ago by people who had moved here from other parts of the world. An Englishman brought the first starlings to New York because he wanted the "new world" to have all the wildlife species mentioned in Shakespeare's work. Starlings are now pests virtually throughout the nation, and massive roosting flocks have created serious problems in some areas, even affecting housing values.

It may be too late to do anything about starlings, carp, fire ants and Asiatic clams — all of which create problems for native wildlife, and sometimes people too — because they're already established. The critical problem facing professionals now is how to keep such undesirable species as the gypsy moth from becoming established in North Carolina. These moths have stripped whole forests bare of foliage in the northeastern states.

It is a complex issue and there are not always easy answers; but fortunately, professional wildlife managers are very careful, especially in this State. In recent years, the only exotic introduction by professionals that has caused serious problems occurred in Arkansas with the introduction of grass carp, an Asian exotic that is destroying native aquatic grasses in the Mississippi drainage. Even so, the grass carp would never have been stocked if local politicians had not won out over professional judgment.

In North Carolina, steelhead trout and striper-white bass hybrids are two of the most recent exotic introductions, and they are doing nicely. The Florida largemouth bass is still being studied and may never be introduced. While there is less likelihood that an intentional introduction will prove disastrous, there are still dangers from accidental introductions.

Which brings us to the matter of catfish who stroll across roads. The walking catfish — another Asian exotic — is indeed capable of moving overland, and these fish have become established in Florida where they have seriously damaged native fish populations.

Walking catfish, along with piranhas, have been outlawed in North Carolina even though they might not survive our winters unless they were living in heated power plant effluents. But why take a chance? A handful of piranhas could sure spoil a swimming party, not to mention what they might do to our native fish populations.

March 1979

Volume 43, No. 3

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Department of
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WILDLIFE IN NORTH CAROLINA

"Wildlife in North Carolina" is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

John James Audubon returned to this home in New York City after his final trip west. Before the city enveloped it, the estate occupied 35 acres on the Hudson River. The property was called "Minnie's Land" after Audubon's wife because his two sons, Victor and John often called their mother "Minnie." See page seven for more about our best known bird artist.

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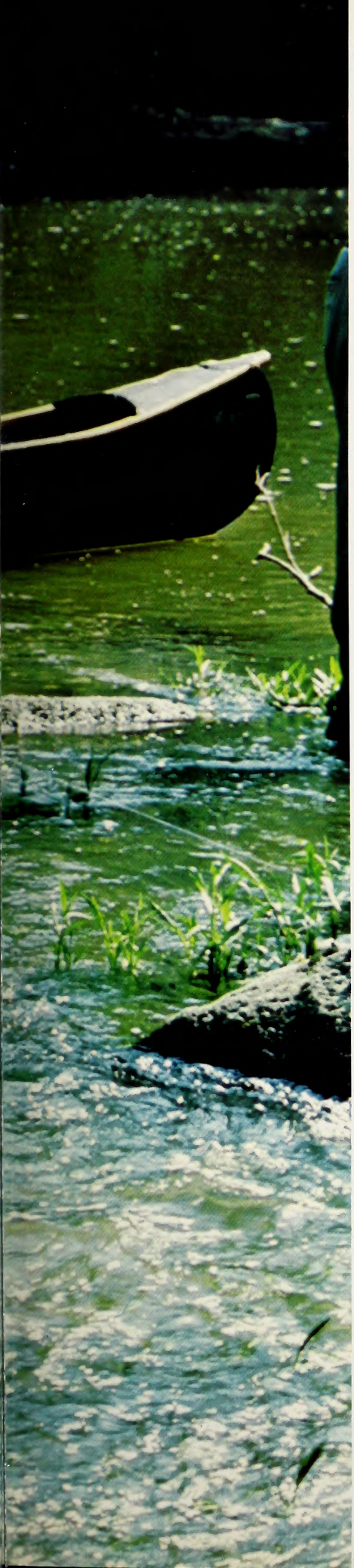

By Ted Dossett

World's Rarest Bass?

The Roanoke bass may live in only a handful of streams in Piedmont North Carolina, yet with continued careful management, this fine sportfish may become more popular and widespread.

The rivers and streams along the fall line between the Piedmont and Coastal Plain are swift and rocky like mountain streams. Ted Dossett (left) often drifts a river in a canoe until he comes to a likely looking spot, then he wades and fishes. In some of these streams, the rare Roanoke bass or redeye (above) is one of the fish you might catch.

For what seemed like the fortieth time, Bill's awed shout of amazement echoed across the river. Then his awe changed to good-natured mockery as he remembered me. "HoooOooo . . . that's number 13 and he's a nice one!" I glared in sullen silence and condemned him to an eternity of broken bail springs. But he was untouched by such malice and instead held up a fine fish, a Roanoke bass that would easily go a pound-and-a-half.

So far, it had been a typical Roanoke bass fishing expedition, full of contradictions and wrong guesses, but with perhaps a bit more than the usual amount of treachery thrown in. I knew this stretch of river better than Bill and had figured to maneuver him away from all the good Roanoke bass hides. But there he stood, in one of the very holes I had so carefully guided him into, stringing up his thirteenth fish. In fact, it was becoming clear that my underhandedness wasn't as one-sided as it appeared. Shortly after Bill had taken a seven fish lead on me, I asked what lure he was using.

"Oh, one of them Mepps minnows with a silver blade," he casually replied. But he forgot about the angle of the sun; and on his next backcast, I caught a glint of gold as his rod tip arched backward.

Yet, it wasn't the one-upmanship between Bill and myself that really typified the trip, but the contrariness of our quarry, the Roanoke bass. It

photography by Ken Taylor

Ultra-light spinning tackle with four-pound test line is the best tackle to use for Piedmont streams. Small lures with spinners seem to work best, but carry a good supply since you'll undoubtedly lose some. Ted Dossett (right) tangles with a scrappy Roanoke which he hooked in fast water.

had again apparently changed its habits and was in all the wrong places. The Roanoke, or redeye as he is frequently called, is supposed to inhabit the quick-flowing water of many of North Carolina's fall line streams and rivers. In the spring particularly, it lurks among the shallow runs that twist through rocks and smartweed and preys on crayfish and minnows. So it didn't make sense, I rationalized, for anyone to be catching redeye out of a pool below which spilled a perfectly good rapid.

It suddenly grew quiet on the other side of the river. Bill's numbers game had apparently reversed the jinx; for on the next cast, I had a strike. But there was still nothing to get excited about, for the violence of the hit told me it was probably a robin. I waited for the energy to fade; but the fish stayed heavy on the line, and I knew then it was my first Roanoke bass of the day. The rod bent into a tight arc as the fish struggled toward the base of a massive rock, then it turned and ran straight toward me. The moment's slack it gained by this strategy was all it needed to drive beneath an overhang of smartweed and entangle itself. For a moment I continued the fierce contest. Then I admitted to myself that smartweed pulls real good but it doesn't put up much of a fight.

The lost fish actually foretold of better things to come; for in the next hour, I pulled in sixteen good fish from a stretch where the pool lipped over into a rapid. But all of this added up to another mystery; the area I caught them in was not much more than twenty feet square. The fish seemed almost disdainful of my presence and continued to strike on nearly every cast. There were even a few instances when I missed a fish only to have it strike again several casts later, behavior unheard of for a redeye. Then, abruptly as they began, they turned off. We fished several more good looking pools and rapids below our glory hole, but the redeye had returned to their normal close-mouthed contrariness and completely ignored our offerings.

The vagaries of the existence of the Roanoke bass have been enhanced by the fact that it was more or less lost for almost a hundred years. In 1867, Zoologist E.D. Cope described a redeye specimen he took from the Roanoke River in Virginia; but for close to a century after that, it was almost completely forgotten by the scientific community. Finally, in 1963, a summer intern working for the North Carolina Wildlife Commission's Division of Inland Fisheries was told to identify a fish specimen taken from Fishing Creek in Halifax County. It seemed a simple enough assignment, but the intern kept coming back with the wrong answers. For years, Commission fisheries biologists had simply identified the fish as a rock bass, a fish commonly found in North Carolina's western streams and rivers. But the steadfast conclusions of the novice biologist stirred the curiosity of these old hands enough for them to eventually reaffirm the existence of the Roanoke bass.

Of course, local fishermen had always been aware of the Roanoke bass. They might have called it by other names — redeye chub or red perch — but they all sought it for the same reasons — first-class fighting ability, palatability and size. Redeye weighing a pound are not common, and there have been reports of them weighing over four pounds. In fact, the growth rate of the Roanoke bass far outstrips that of the robin and other panfish that inhabit the same waters.

It became apparent to biologists that all these outstanding characteristics made the Roanoke bass an excellent choice for introduction in the streams and rivers of adjoining watersheds. In fact, the major tributaries of the Neuse River, the redeye's native habitat, are hardly a stone's throw from the Cape Fear River drainages. The apparent similarity and close proximity of the two ecosystems seemed to make the project a sure thing, and fish were stocked in several streams in Chatham and Randolph counties. Many of the streams had excellent water quality, but it seemed to make no difference to the Roanoke bass; fish samples taken from the streams over a period of the next several years failed to turn up any definite sign of reproduction. It was almost as if, in order to show its arbitrary na-

Although the range of the Roanoke bass is restricted to the fall-line streams in North Carolina and possibly southern Virginia, these fish are fairly abundant in the waters they inhabit. This stringer of Roanoke bass shows their average size. Anglers fishing these streams can also expect to catch robin, bluegills, chain pickerel and an occasional largemouth bass.

ture, the Roanoke bass had refused to thrive in its new surroundings. Although the project is continuing, biologists still have no real clue as to why the redeye hasn't taken to its new habitat. Chalk up another triumph for the mysterious redeye.

There is no mystery to the fact that degraded streams and rivers have played a large part in the diminishing range of the Roanoke bass. Chemical and other types of pollution, heavy silt loads, removal of streamside vegetation and the construction of impoundments, all have led to a decline in the places where the redeye can be found — an area that was not overly large to begin with. Proof of their past abundance can be found in the early account of an angler, who in 1893, tells of catching three redeye from the Neuse River at Milburnie, a spot a few miles east of Raleigh. The same report notes that, a year earlier, a Roanoke bass was collected from Crabtree Creek, a now much degraded stream that loops through Raleigh.

Ironically, this narrator was also confused about the identity of the fish, equating it with the rock bass of our western streams and rivers. However, he had no doubts about the redeye as a sports fish, calling it "the gamest fish I have ever taken in North Carolina."

The redeye has taken the path of a lot of other wildlife and is long gone from the Neuse. If you are to seek it today, you must travel to the upper reaches of the fall-line streams where the water is as clear and clean as should be expected in this age. It is best to go in the spring, when the light filters through the pale green leaves and the hornyhead chub is so preoccupied with his spawning ritual that he will boldly splash right by where you stand.

The water is warm enough for wading then, and it is the best way to fish because it enables you to work the pools and riffles more thoroughly. If you use a boat, a canoe is the best choice because of its maneuverability; but its primary purpose is to get the fisherman through the deep holes. Of course, the deeper holes should not be ignored for they are habitat for largemouth bass and in particular, chain pickerel.

The enjoyment of stream fishing is greatly enhanced by the use of ultra-light spinning tackle with two-to-four pound test line. A variety of small spinners such as the beetle spin, Mepps minnow and Panther Martin, have taken a lot of fish for me over the years. Such light tackle puts a real challenge into battling a pound Roanoker out of the smartweed and through the rapids. And to hook into a three-pound largemouth or a 20-inch chain pickerel, ranks right up there with any other fishing experience.

Over the years, a recurring fantasy is to have a Roanoke bass rise to take a fly among the rolling rapids. What a marvelous contest that would be. The imagination feasts upon such a vision, but it is a lean reality for I have yet to succeed in taking a redeye on a fly rod. That doesn't mean it isn't done for I know of several anglers who have used a fly rod and large streamers to pile up strings of redeye. Even the mundane popping bug worked magic for a couple of fishermen who, on a May evening, caught and released over thirty redeye, many weighing better than two pounds.

In these times, the pursuit of the Roanoke bass in our fall-line streams and rivers represents a unique experience. It is more than a simple quest to fill a stringer with fish. The seemingly contrary nature of the redeye compels the angler to observe and record, probe the nature of the ecosystem around him. And with that comes the awareness of the interrelationships of the environment through which he moves. In the green, gold, black and silver of the fish itself is mirrored the sunlight and shadow, sand, rocks and plant life of the river system. Wading a stream that is unencumbered by steel and concrete becomes direct involvement. Terrestrial wildlife takes little notice of the figure in the stream because, for the moment, he has become part of the river. And, because of the times in which we live, it is this spectrum of rare experience that makes seeking the Roanoke bass more than a sport — it becomes a privilege.

Ted Dossett has fished for Roanoke bass and other fish in the Piedmont streams for years.

Frontier Artist
John J. Audubon

America's most famous bird artist was a scholastic misfit, a backwoods wanderer with a lust for adventure, a practical joker with a keen sense of humor, and a crack shot who understood that there was no contradiction between a love of hunting and love of wildlife.

By Mark Taylor

The ragged frontiersman with the foreign accent who roamed the waterfront of New Orleans in the spring of 1821 looked little different from the other mountain men, trappers, traders, roustabouts, rascals and free spirits that drifted along the fringe of America's settlements.

Before his life was over, the man would rub shoulders with presidents, royalty and the learned men of his time. He would drink grog with Sam Houston in a log hut in the newly formed Republic of Texas, and learn to "bark a squirrel" from an aging frontiersman in Missouri named Daniel Boone. He was a crack shot and would be acclaimed as one of the greatest ornithologists and wildlife artists of all time. But at the age of 41, he was stuck in New Orleans without a cent to his name. A grim debtor's cell was a recent memory, his money had been stolen, and he had even been forced to sell his ever faithful companion — his double-barreled shotgun. He slept on the open decks of the flatboats tied up along the waterfront, and dinner was stale bread and odd bits of ham begged from the rivermen.

Success did not come easily to John James Audubon. When things looked darkest in New Orleans, he was rescued by a heavily veiled "female of fine form." The Creole beauty asked if Audubon would paint her portrait in the nude, and Audubon reluctantly agreed, although he had never painted a nude before. He must have done well, for he received some cash and a new shotgun for his efforts, as well as commissions from the lady's friends. The painting had been a difficult one for him, for he "could not well reconcile all the feelings that were necessary to draw well without mingling with them some of a very different nature."

Audubon was born on the island of Haiti in 1785 — the illegitimate son of Jean Audubon, a French naval officer and a wealthy sugar planter and slave trader. When Audubon was four, his father returned to France and took his young son with him. His stepmother, Anne, took a liking to him, and his parents adopted him as one of their legal sons.

Audubon's boyhood on the family estate was average in most respects. He became very good at dancing, fencing, art, taxidermy and hunting and fishing. He also showed an amazing disdain for anything useful and often skipped out on his lessons to roam the nearby forests, shooting specimens for his taxidermy work and drawings. In desperation, his father finally enrolled him in a naval academy, hoping to instill some discipline and direction in the lad. Young Audubon escaped through the window of his room and was soon back at the family estate. Art school in Paris didn't last much longer. Audubon worked

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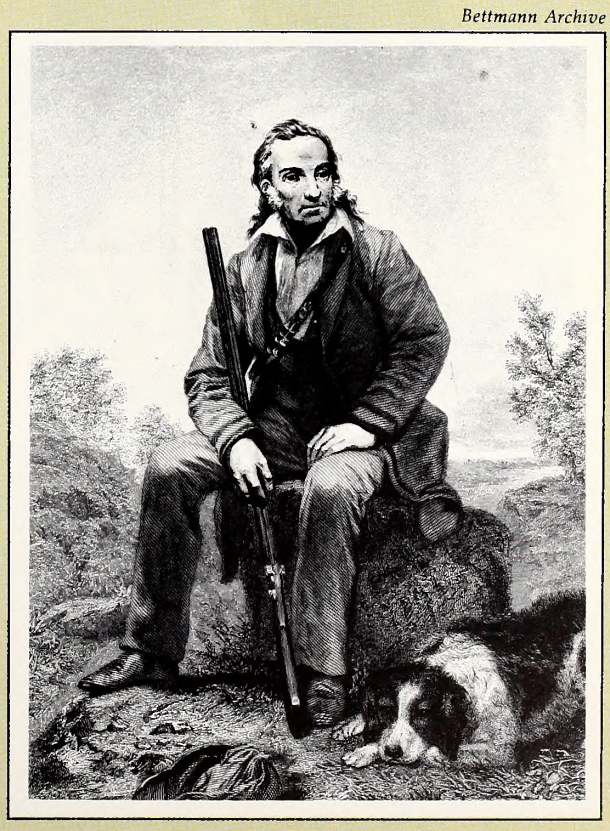


Ivory-billed Woodpecker Plate 66

diligently for a short while; but when his teacher insisted that he draw subjects other than birds, his interest waned and he soon quit.

The logical place to send such a headstrong lad was America. His father hoped that giving him some responsibilities in running a farm owned by the family in Pennsylvania would "straighten the boy out" and he would also escape conscription into Napoleon's swelling armies.

Mill Grove, Pennsylvania in 1803 proved to be a poor choice as a place to "straighten out" a young man whose chief interests were hunting, fishing, drawing birds, riding fine horses and chasing the ladies. Young Audubon had his clashes with the sober, straight-laced Quaker family who managed the estate; but other than that, he had a generally fine time. One spring he observed a flock of visiting phoebes and wondered if they returned to the same spot year after year. He captured several of the birds in a cave, tied silver threads around their legs, and waited a year. His suspicions were confirmed, and he had done the first birdbanding in the United States.

After several years, Audubon grew restless; and in 1807, he decided to head west.

He and Ferdinand Rozier, a close friend, had decided to open a general store in Louisville, Kentucky. Before he left, Audubon became a naturalized United States citizen and never again referred to himself as French.

Audubon was not cut out for storekeeping. In 1808, he returned to Mill Grove and married Lucy Blakewell, daughter of a neighboring farmer. He brought her back to Louisville where they lived in a frontier tavern. While Rozier tended the store and Lucy minded the baby, Audubon went hunting with neighboring settlers and Indians. He kept his and Rozier's families in food with his shotgun and fishing rod.

A second store in Henderson also failed, but an incident occurred at the store which gave direction to Audubon's ambitions. One day a visiting naturalist from Philadelphia named Alexander Wilson stopped in and tried to sell Audubon a book of prints of American birds. Audubon eagerly looked the book over and agreed to buy a copy. Rozier very effectively squelched the sale by remarking that Audubon's own bird paintings were far superior.

The Henderson store failed; and in 1811, Audubon and Rozier moved downriver on a flatboat to St. Genevieve, Missouri. En route, the flatboat was caught in an ice jam, and the men were forced to stay with some Osage Indians for three weeks. While Rozier moped about the camp, fretting about the lost time, Audubon was out hunting with the Indians, drawing sketches of them, and collecting new birds to paint. Eventually, the men made it to Missouri, where they made a killing on the 300 barrels of whiskey they had shipped downriver. Audubon missed Kentucky; and after a short while, returned to his family in Henderson.

By the time Audubon returned to Kentucky, he had decided to paint all the birds in North America, and then have the paintings published in a book. To do this he needed a substantial income, so he set out to make some real money. Storekeeping, running a steamboat, and fur trading expeditions were just a few of the losing ventures he became involved in. Yet the years in Henderson were not unhappy or unproductive. Audubon was busy painting birds and often played host to some of the intriguing characters that drifted in and out of America's frontiers.

One man, Constantine Rafinesque, was a well-known naturalist and a frequent guest in the Audubon home. Rafinesque was a living stereotype of the eccentric naturalist and was often the butt of practical jokes. One night while Rafinesque was visiting, Audubon heard a loud crashing in the guest room after everyone had gone to bed. He went upstairs to see what the commotion was and found his guest scurrying about the room stark naked trying to kill a bat with a violin. Before Audubon could stop him, both the bat and the violin were somewhat the worse for wear.

Audubon couldn't let the loss of his favorite violin go by. With much care, he described and sketched a series of ten nonexistent fish which had incredible qualities. He gave these to the gullible naturalist, and Rafinesque later published descriptions of the fish in one of his books.

"Barking of squirrels is a delightful sport, and in my opinion requires a greater degree of accuracy than any other. I first witnessed this manner of procuring squirrels whilst near the town of Frankfort. The performer was the celebrated Daniel Boone. Boone pointed to a squirrel which had observed us, crouched on a branch about 50 paces distant, and bade me mark well the spot where the ball should hit. The whiplike report resounded through the woods and along the hills, in repeated echoes. Judge of my surprise when I perceived that the ball had hit the piece of bark immediately beneath the squirrel, and shivered it into splinters, the concussion produced by which had killed the animal, and sent it whirling through the air. Boone kept up his firing, and, before many hours had elapsed, we had procured as many squirrels as we wished."

Audubon's journals describing his meeting with D. Boone, in 1810

Western Tanager and Scarlet Tanager *Plate 354*

Unfortunately, Audubon's horseplay came back to haunt him. "If Audubon would invent nonexistent fish, why shouldn't he make up imaginary birds for his books?" his critics later charged. On another occasion, one of Audubon's practical jokes had less dire consequences. Audubon was guiding a foreign client on a hunting trip, and the client insisted that the common Kentucky skunk was really a new species of squirrel. Audubon agreed, and urged the man to try and capture one with his bare hands. The expected results ensued, and it is doubtful if Audubon ever had any repeat business from that client.

When the business panic of 1819 hit, Audubon was running an "infernal" steam powered gristmill and sawmill. The mills failed, and Audubon was jailed as a debtor. When Audubon got out of jail, owning nothing but the clothes on his back, his shotgun, and his paintings, he decided to make a fresh start. He was going to concentrate on his art and forget about business.

For the next two years Audubon drifted through Kentucky, Ohio, and Louisiana. He worked for awhile as a taxidermist in a museum in Cincinnati, but the museum soon failed. His mainstay was painting portraits — a picture in exchange for a night's lodging at a tavern or for a steamboat passage farther downriver. He charged $5 to $25 for a portrait, depending upon how desperate his financial condition was at the time. In one grisly incident, the parents of a newly deceased infant had the child disinterred from the grave so that Audubon could paint its likeness. He also spent a winter in Kentucky painting murals in steamboat interiors. And he continued to paint birds.

Audubon drifted into New Orleans in the early 1820's without a cent to his name. He soon made a name for himself and procured several positions teaching art to wealthy planter's children while his wife taught other subjects. The rich plantations of the delta country were perfect for Audubon — he taught for a few hours during the afternoons and spent his mornings and evenings hunting birds, which he would bring back to his studios and wire into lifelike positions before painting them. He also cut open the gizzards of the birds he was painting to find out what they had been feeding on, and he would somehow work this into his paintings. He claimed that it was a "poor day's hunting" when he killed less than 100 birds. Audubon also developed a brisk mail order business with American and European naturalists, selling them botanical and zoological specimens. One of his constant companions during these years was Joseph Mason, a gifted artist and botanist in his mid-teens, who traveled with Audubon and his family. Mason painted 55 of the backgrounds in Audubon's paintings. Although Audubon's fiery temper often got him into trouble, he had no problems securing work at one plantation or another.

In 1824, Audubon finally decided to get his works published. He took all of his and his wife's savings and made the rounds of the publishing houses in New York, Philadelphia and Boston. All of them turned him down. They felt the works wouldn't sell. When he ran out of money, he returned to New Orleans and decided that he would try to get the paintings published in Europe. For the next three years, he and Lucy worked on Louisiana plantations together, saving everything they made. He headed for Europe in 1827.

Audubon's work created an instant sensation when he landed in England. He was quickly recognized as a pacesetter in the art world.

At the time, most bird paintings were closer to being ornithological drafting than art. Birds were shown in stiff formal profiles against a white background. Audubon's work was completely different; birds were portrayed in their natural surroundings and were often shown preying on their primary foods. In some of Audubon's works, birds are shown in contorted positions. He only did this when there was some hidden anatomical feature he wished to bring out, and he usually used several birds in different positions to illustrate their features.

It didn't take long for Audubon to find a publisher. Robert Harvil, an Edinburgh printer, agreed to produce the paintings in two volumes of engravings known as the "Birds of America." Each painting was to show the birds life-sized, and the prints measured 39½ by 26½ inches. The cost for the set was $1,000. For the next three years, Audubon spent most of his time in Europe finishing the paintings and overseeing the

"We talked of the country where we were, of the beings best fitted to live and prosper here, not only of our species, but of all species, and also of the enormous destruction of everything here, except the rocks; the aborigines themselves are melting away before the encroachments of the white man, who looks without pity upon the decrease of the devoted Indian, from whom he rifles home, food, clothing, and life."

For as the Deer, the Caribou, and all other game is killed for the dollar which its skin brings in, the Indian must search in vain over the devestated country for that on which he is accustomed to feed, till, worn out by sorrow, despair, and want, he either goes far from his early haunts to others, which in time will be similarly invaded, or he lies on the rocky seashore and dies. We are often told rum kills the Indian; I think not; it is oftener the want of food, the loss of hope as he loses sight of all that was once abundent, before the white man intruded on his land and killed off the wild Quadrupeds and birds with which he has fed and clothed himself since creation. Nature herself seems perishing. Labrador must shortly be depeopled, not only of aboriginal man, but of all else having life, owing to man's cupidity. When no more fish, no more game, no more birds exist on her hills, along her coasts, and in her rivers, then she will be abandoned and deserted like a worn out field."

Audubon's Labrador Journals July 19, 1833

Summer or Wood Duck Plate 206

"I shall not describe the massacres which took place among the different parties of white and red men, as the former moved down the Ohio; because I have never been very fond of battles, and indeed have always wished that the world was more peacably inclined than it is; and shall merely add that, in one way or the other, Kentucky was wrested from the original owners of the soil."

Audubon's Journals, Kentucky 1810

"Fur animals are scarse, yet some few Beavers and Otters are caught, a few Martens and Sables, and some Foxes and Lynx, but every year diminishes their numbers. The Fur Company may be called the exterminating medium of these wild and almost uninhabitable climes, where cupidity and the love of gold can alone induce man to reside for a while. Where can I go now, and visit nature undisturbed?"

Audubon's Labrador Journals — June 23, 1833

The prints from paintings of John J. Audubon reproduced here are from the collection of the North Carolina Museum of Art, Raleigh. The prints were a gift of the North Carolina State Library, and are from The Birds of America.

Passenger Pigeon Plate 62

printing. The whole family was involved in the project and Audubon's two grown sons, Victor and John, sent him many of the specimens he needed from America. Both sons had married daughters of the Reverend John Bachman, a clergyman and enthusiastic naturalist from Charleston, South Carolina. Bachman served Audubon as a salesman, specimen collector and close friend. When he was in America, Audubon spent a lot of time in Charleston. Of Audubon's sons, John in particular became a gifted artist, and painted many of the backgrounds in "Birds of America." All told, five different men painted the backgrounds to Audubon's paintings.

The works sold well. Nathan Rothschild bought one but considered the price a bit high. Daniel Webster also bought one, but it took two years of Audubon's hounding to get him to pay up. Lawyers were reluctant to handle the case, for who wanted to tackle a frontier lawyer that had bested Beezlebub himself in a courtroom fray.

During the mid and late 1830's, Audubon had the time and money to take extended trips. He spent a lot of time in Texas where he was the guest of Sam Houston, and took several extended trips to the Labrador coast on a chartered schooner. He also roamed the Maine woods and the Florida keys.

Painting the birds of America wasn't enough for Audubon; and in the late 1830's, he embarked on a more ambitious project. He started on the "Viviparous Quadrupeds of America" and intended to paint every mammal in the United States, Pacific Northwest, Canada, and Arctic. By 1841, Audubon had painted 36 species and needed to do more traveling.

A trip to the west was in order if Audubon was going to finish his work; and in 1842, he made the necessary arrangements with President Tyler. His destination was Fort Union — a post owned by the American Fur Company in what is now Montana, located where the Yellowstone River meets the upper Missouri. The arrangements were made through Pierre Choteau, the head of the American Fur Company.

On the first leg of his journey, Audubon took the steamboat "Gallant" from Kentucky to St. Louis. Accustomed as he was to hard living, the "Gallant" was still a little too much for Audubon. The boat was the "filthiest he ever saw"; and as for the food, "all is greasy and nasty."

Audubon reached St. Louis in the spring of 1843, where he talked with William Sublette, Tom Fitzpatrick, and other famous trappers about the wildlife of the west. He was dismayed to learn that, beyond beavers and bears, the mountain men weren't really concerned with wildlife. They were too busy trying to keep their hair from winding up on some Indian's trophy stick to study nature.

Audubon left St. Louis in the spring of 1843 on the steamboat "Omega," along with about 100 drunken French Canadian trappers and several Indians bound for their villages upriver. During the voyage he amused himself by drawing and hunting the abundant wildlife that covered the Great Plains. Audubon was a prodigious correspondent and wrote many letters to his wife and family. A letter to his brother William, written while the steamboat "happens to be fast upon an infernal bar in this infernal river," describes the abundance of wildlife on the Great Plains.

"Most of the wolves we have seen are white and of very large size. The shores of the river are strewed with dead buffaloes, males, females, and young and the wolves, ravens, and buzzards gorge themselves with the tainted flesh before our eyes. Almost every green spot along the hillsides has its gangs of buffaloes and so many dead are found that no doubt thousands of them died from the severity of the past winter and the consequent want of food. The antelopes are beautiful small animals and run like the wind, but not so fast as a rifle ball . . ."

Audubon spent the summer in Fort Union, drawing animals and pursuing one of his newfound pleasures, hunting buffaloes from horseback. He did not venture far from the Fort due to the "treacherous rascals" that roamed nearby, the hostile Blackfeet Indians.

The trip to Fort Union was Audubon's last major expedition. His health soon failed him, and he never did come close to finishing his work on Quadrupeds. He spent the last five years of his life resting quietly at his New York Estate, a shell of the robust man he once was. He quietly passed away in 1851.

Carolina Parakeet Plate 26

Tactics For Spring Gobblers

Management is bringing the wild turkey back, but it still takes considerable skill to bag a wary gobbler.

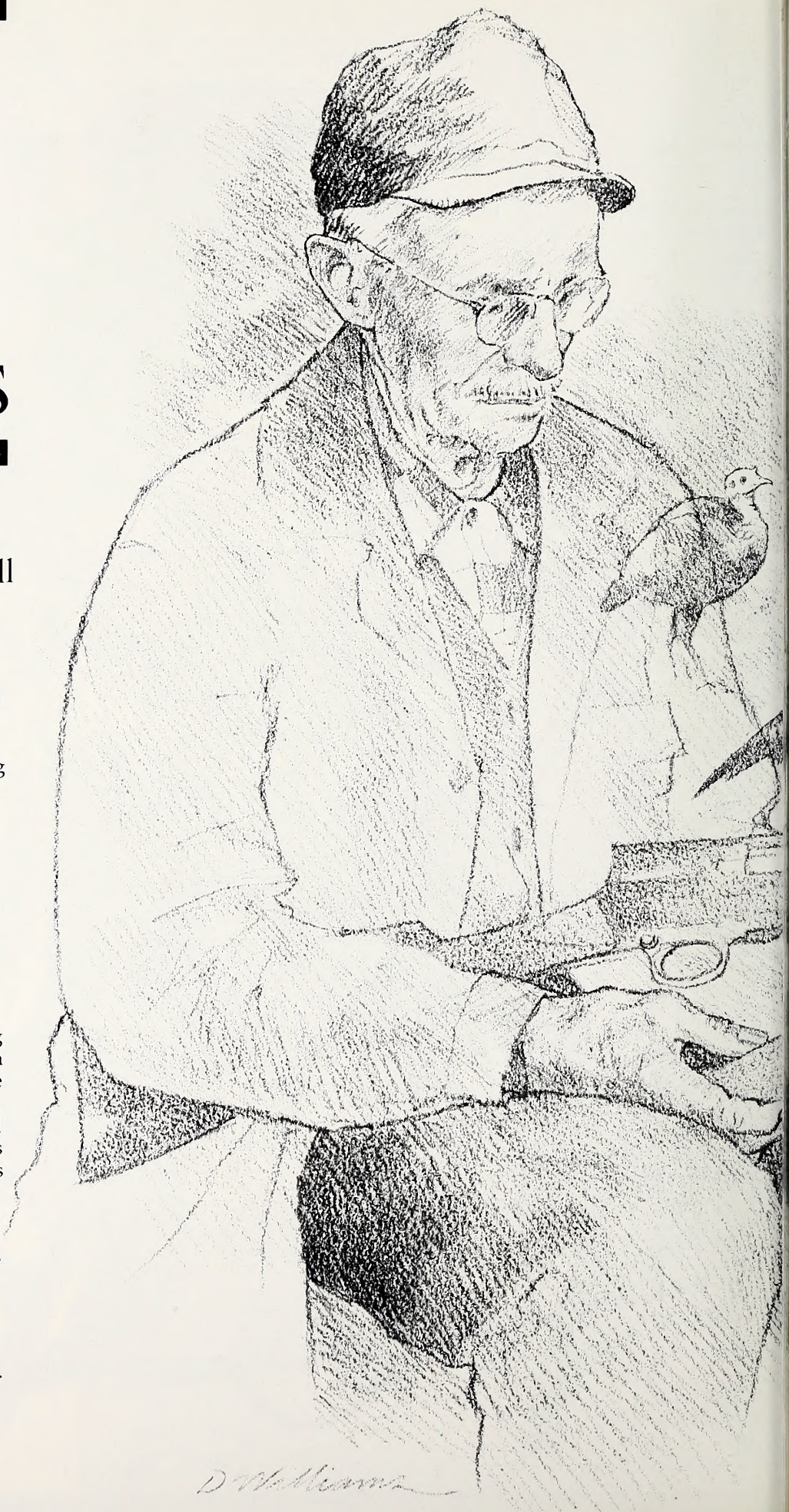
By Charles Elliott

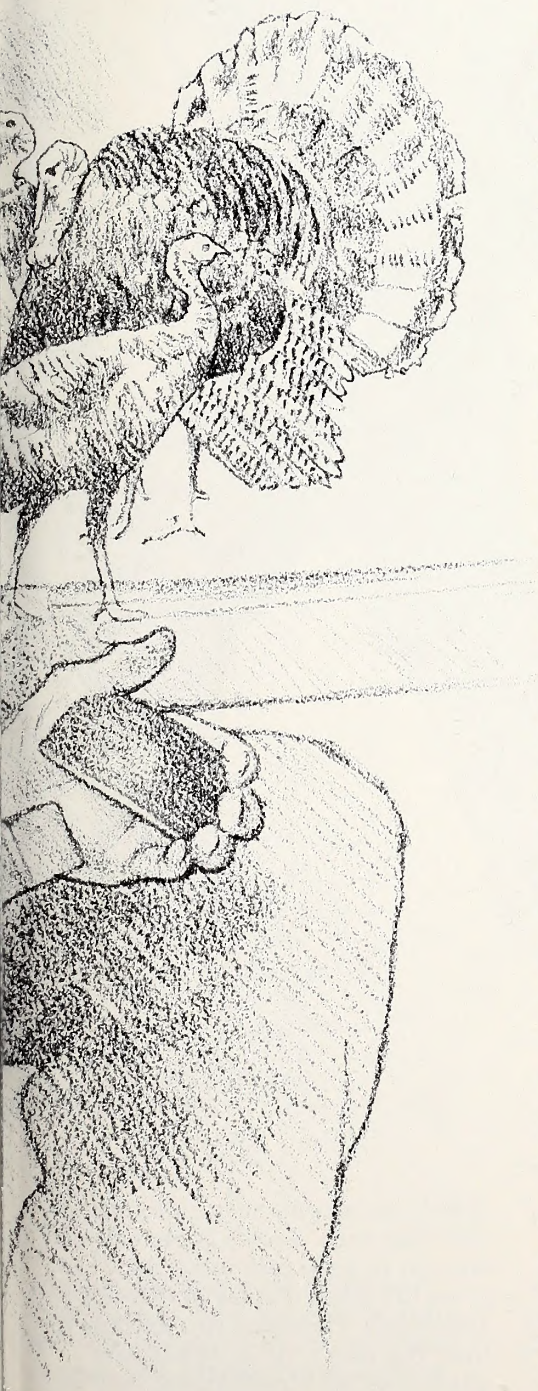
I wasn't sure whether I had seen a leaf move, or a shadow. The forest around me was almost breathless and my eyes could have been playing games with the shadows that clung between the splotches of sunlight. But the moment held more drama than that.

For an hour I had made conversation with a gobbler down in the hollow. Then the bird had suddenly gone silent. This could mean one of several things. Something I said through my wingbone call might have spooked him into the next county. A prowling fox or bobcat could have tuned in on our love fest and come to investigate the possibility of a choice dinner. It was possible that another hunter had intruded. Or the big bird was on his stealthy way to what he thought was an ardent hen.

No matter how long any man has hunted wild turkeys, or how many have gone down under his gun, the very anticipation of seeing a magnificent gobbler, tall and iridescent in the sunlight, does things to his coronary system. If it doesn't, he's better off at hopscotch.

I sat motionless against the tree trunk and strained my eyes for a further glimpse of movement. The eyes of a turkey are as keen as any in





the forest and anything he doesn't understand will cause him to vanish as though he'd never been there at all. His hearing is every bit as good. So I waited, trying not to wheeze in my excitement, hoping the gobbler wouldn't hear the drum that had taken over where my heart was supposed to be.

For five minutes I kept my eyes glued on the wall of brush where I was certain something had moved. I was close to suspecting that my imagination had worked overtime, when it slowly dawned on my incredulous senses that I was looking at a gobbler. He stood in an open patch of sunlight, no more than ten feet to the left of where I had expected the bird to appear. There was no way he could have reached the opening without being observed, but somehow he had. The impression was that he had risen out of the earth.

He stood, his head high, well within gunshot range — no more than 30 yards away. My gun was across my knees. If I swung it for a shot, he would vanish as miraculously as he had appeared. For the moment all I could do was sit and wonder what my next move should be. I didn't even dare look at him directly, for often a stare attracts attention.

This is the climax, the supreme moment in turkey hunting. Each step leading up to it is one in a series of dramatic suspenses which must be exercised with extreme finesse and knowledge. These add up to the full pleasure of gobbler hunting. The poorest part of any hunt is pulling the trigger.

My maneuvering up to this point had brought an old tom within range. But I didn't try for a moment to fool myself. That bird was not yet in the bag. I'd lost gobblers before when they were this close. There was one step yet to make.

How I brought this gobbler within range is what makes turkey hunting one of the most delightful and precise of all shooting sports.

If you have the kind of mind that makes evaluations, you might break down gobbler hunting into two or three categories. One is knowledge of the bird's habits and habitat. Just as necessary is your skill in doing business with him. Since the stool won't stand on two legs, perhaps we should make the third leg your personal traits of woodsmanship, and your patience, which is more than often a deciding factor.

In other words, just how do you go about putting a reluctant gobbler on the Thanksgiving or Christmas table? Assuming, of course, that we leave out the element of luck.

If I knew nothing at all about turkeys or hunting them, my very first step would be to read everything I could find on the subject. Turkey stories appear frequently in the outdoor magazines, and there is enough material to keep your eyes busy for a while. Several good books are available and you can find at least some of these in a public library. From these stories and books you can glean a lot of information on where and how a turkey lives. You might also learn how a turkey usually acts under a given set of circumstances — though the best rule of thumb is to always expect the unexpected. The printed page will give you the quickest basic knowledge of the turkey clan. You can build on this later by studying the birds in the wild, where you'll find out things not printed in the books. Each individual bird is a distinct character.

The information you gather *before* you start chasing after an old gobbler will give you most of the procedures on how to go about it, and what you learn on your own from that point will certainly add to that information.

If you are fortunate enough to know an old turkey hunter who will take you under his flight feathers for a few trips, it can help you as much as anything else. But even with this, there is no way to become an expert at the game except by trying it on your own.

Probably your most difficult chore is to master a call. Dozens of turkey calls are available. They range from the box type that comes in all shapes and sizes, to such mouth types as the "snuff box", the wingbone, and the diaphragm that fits in the roof of your mouth and is possibly the most difficult to master. For the beginner I recommend the box type with a lid that scrapes across the side of the box to produce the clucks and yelps of a hen, as well as a reasonable imitation of the gobble. Go to your sporting goods store and find a call that's easiest for you to use, then stick with it until it makes the proper music. You can take up the other calls later.

Naturally you must be able to

illustrated by David Williams

recognize and duplicate the proper notes that make an old gobbler stand up and listen and then come looking for you. If possible, practice your calls on barnyard turkeys, even though they may eye your efforts with tolerance and possibly a degree of humor. Another source is the records and tapes on turkey calls and calling put out by a number of companies. These will give you a good start toward learning the language of the wild flocks. Then, experience in the woods will teach you when and when not to call, and how often, to keep a gobbler interested. Until you do learn, you'll draw a blank with many a bird.

After more than half a century of gobbler hunting, I still make certain preparations before the season opens. I already know how my old model 12, 12-gauge, turkey gun shoots. If I didn't, I'd test its patterns with No. 2, 4 and 6 shot in both high brass and magnum loads at 20, 30 and 40 yards to see how many shot it might put in a gobbler's head at those distances. The most effective way to do this is with a clean sheet of plain wrapping paper for each shell. On each sheet I draw the head of a turkey to make the tests more interesting.

Even though I've been using my favorite calls for more than 50 years, I practice on each for quality and accuracy of tone, for a month before season opens. I have no desire to walk into turkey woods on the first morning of season with my pipes rusty.

I check my other equipment, too, and make a list to be sure I won't forget anything. Into my shoulder bag go such items as bowhunter's camouflage paint, compass, waterproof matchbox, length of stout cord, small pruning shears to help make a quick blind, camouflage gloves, light rain gear and extra turkey calls. Instead of the camouflage face paint, some hunters use a face mask.

I start hunting a few days before season. I don't carry a gun because I'm not especially intrigued with the smell of the average calaboose. I hunt without a gun to scout out territory. I look for scratches, fresh tracks and other sign to tell me where the turkeys have been using. I'm there at dawn, hoping to hear a tom turkey. If there's any rule that says a gobbler must wait until opening day to start sounding off, I can't find it. If I hear a gobbler, or more than one, I'll know where to be when the season comes in. Most veteran turkey shooters prowl a bit before the first legal dawn.

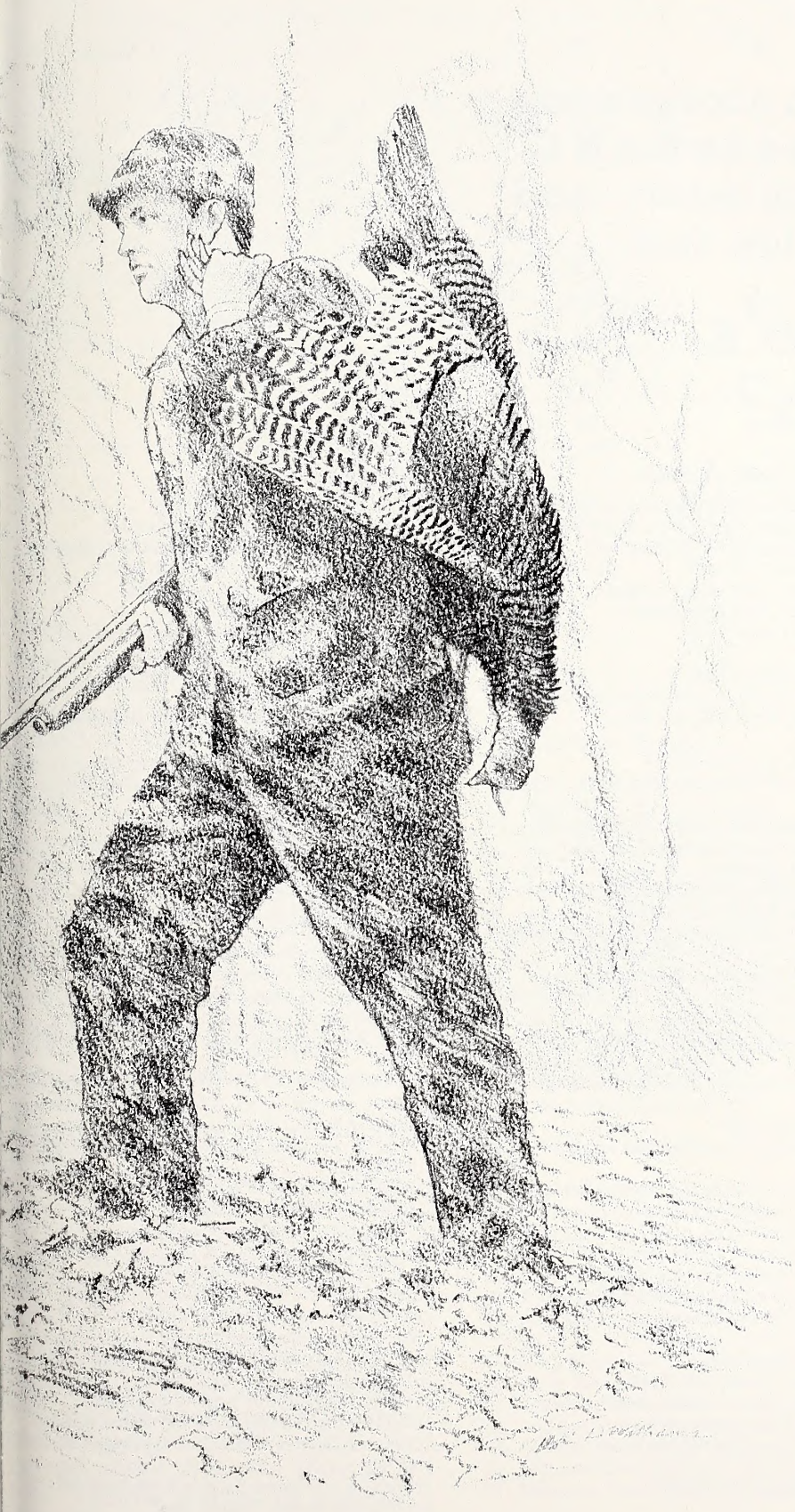
That day finally arrives. I'm in the woods ahead of time, hopefully near the spot where I have heard a bird. I listen from the highest point around. This allows my ears to cover a great territory. Often a gobbler will sound off just once while he's still on the roost — there are others that seem to like the sound of their voices and gobble until well up in the morning. Sometimes you can get one going by making a sound like an owl. The owls are better at this than I am, so I listen for them too, and for the gobbler that might answer.

If I hear a tom turkey early, I hasten toward him and try to get as close as possible before he flies off the roost. If he continues to call, I can get close without spooking him. Otherwise I have to guess. When I reach that point where I want to set up in business, I make my blind. The best spot is at the base of a large tree. I cut bushes and limbs and stick them upright in the ground, in a semi-circle, far out enough so that my gun barrel won't hit the vegetation if I swing it from one side to the other. I arrange the brush thick enough to break my outline and camouflage me without smothering me so that I can't see the forest floor around me.

Not until I am established do I make my first call. If I think the birds are still on the roost, I give only the sleepy cluck of a hen just before she flies down and then a minute or so later a couple of sleepy clucks. If my bird is close, he'll sometimes answer with a lusty gobble. If he doesn't respond, I wait, and just before the light is bright enough for flying down time, I yelp softly.

I've had gobblers launch themselves off a limb and glide to the ground right in front of me, but this doesn't happen often. With my first note, one has pinpointed me, but usually he will fly down out of range. He gobbles, struts and gobbles again. He expects the hen to come to him and you've got to convince him that his reward is bigger and better where you are. Sometimes this takes a bit of doing, especially when bone fide hens are around.

There's always a question of how much to call. Incessant yelping is not natural and will often cause the gobbler to become suspicious and go the other way. You've got to call just enough to keep him interested. He gives his finest display of feathers to attract you. He wants you to come to him. But don't try it. At his first glimpse of your movement, he'll be gone like a dawn mist. Stay where



you are. He may walk away and come back to strut and gobble again, and this can go on for an indefinite period. The longest I ever worked with a gobbler before I pulled the trigger was over five hours and when he finally stepped within range I was within two shakes of a tail feather of giving up and going home.

When a certain time comes, if you've managed to keep his attention, the old bird clams up. When he does this — if there have been no other interruptions — you may be sure that you have either insulted his intelligence and he's looking for fresh meat in new territory, or he's on his way to you.

Now all you can do is wait. Don't move, no matter how painfully the rocks and roots are jabbing into your tonkus. Don't lift a finger. Don't bat an eye if you can help it. You can't see him, but he may be standing out there studying every leaf that hides you. He knows exactly where you are — or where you were the last time you called.

A good percentage of the time he'll circle and come in from behind. Unless you hear him walking in the leaves, the first knowledge you may have of his presence is a sharp "Cut! Cut! Cut!", so close you think he's looking over your shoulder. There's a question in his voice and he's trying to find you. Your inclination is to jump up, swing around and stab flame and shot at him. Don't do it. He may not be as close as you think and the chances are you won't get a shot. At your first movement he gets out of there like his tail was on fire.

There's a vast difference between the questioning "Cut! Cut!" and an alarmed cry of "Phutt! Phutt!" and if you hear the latter, you may want to spring off the ground and try to get him going away. But unless he *is* alarmed, and if you are well hidden, don't move and don't make a sound. He'll probably keep looking and show up in front of your gun. I've had gobblers walk right by me, almost close enough to touch.

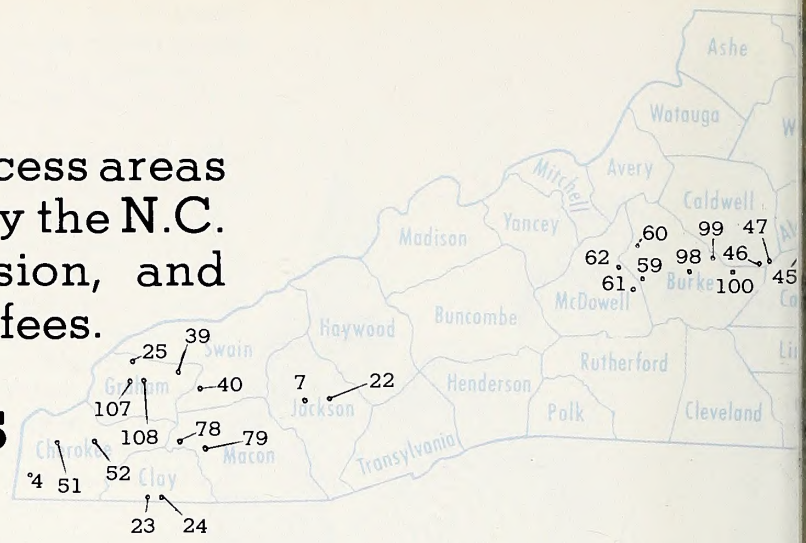
One word of caution. Don't put that gun to your shoulder unless the gobbler is practically in your lap and has no chance of getting away, or unless his eye is out of sight, like behind a tree trunk. I usually sit with my knees drawn up in front of me in such a way that they will support my elbows so that I can hold a gun steady for a longer period than I could in an offhand manner.

We've touched only the bare basics of a few things you must do to help you bring home a gobbler. You could fill a full volume with all the details. After you've been at it for fifty years, you'll probably decide to write that book on your own. If you do, put me down as your first customer.

Charles Elliott has been an avid turkey hunter for decades, and has written many articles on hunting

There are 131 free boating access areas in North Carolina provided by the N.C. Wildlife Resources Commission, and paid for by boat registration fees.

Who Says There's No Free Launch?



By Mark Taylor

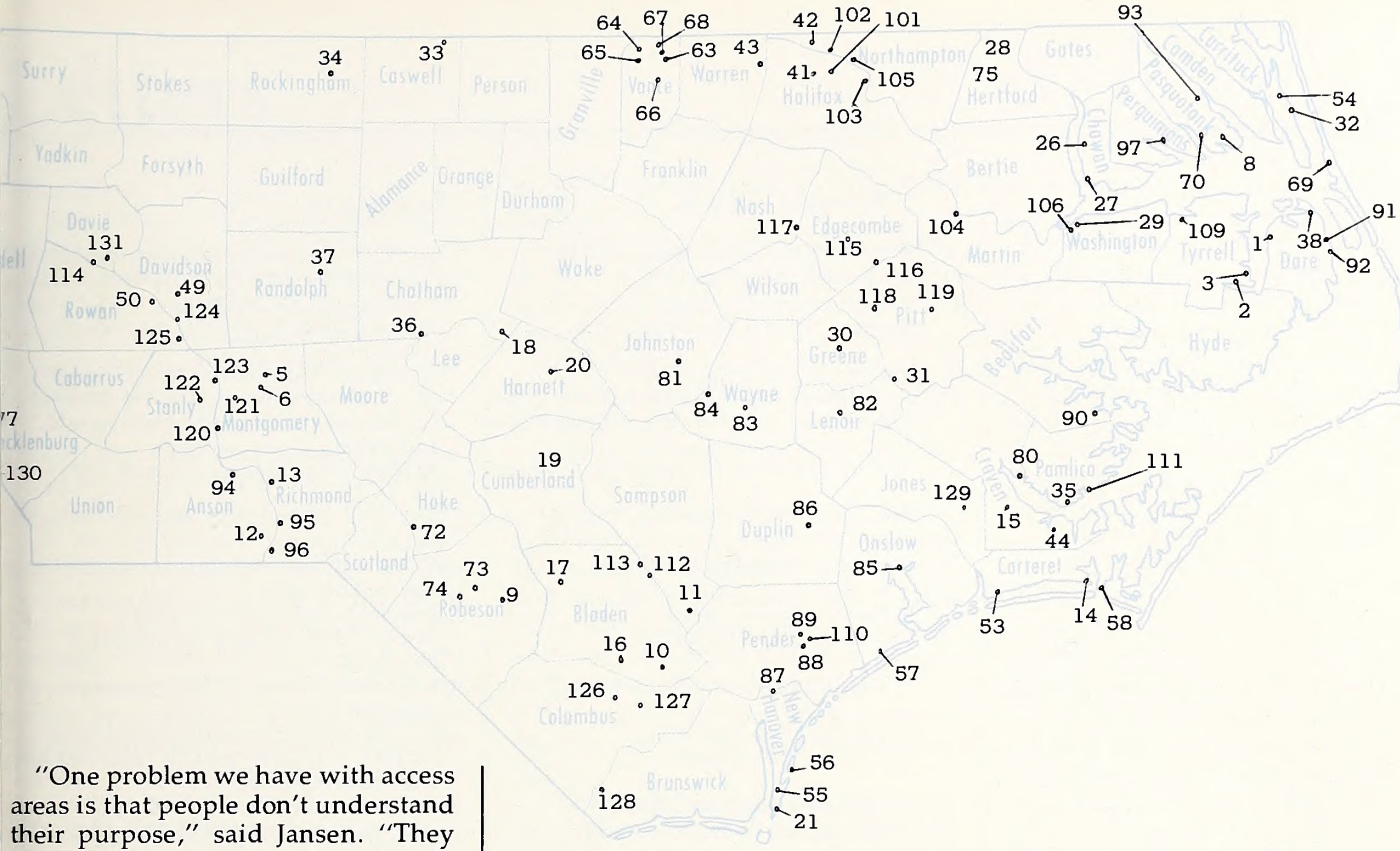
The State of North Carolina has approximately 190,000 registered motorboats. Given the conservative estimate that two or more people would probably use each boat per trip, it's easy to see that there may be a half a million people out on the water on a summer weekend.

With boating so popular, it's no wonder that the Commission's Boating Access Area Program is growing. One of the responsibilities of the N.C. Wildlife Resources Commission's Division of Boating is to provide public access to the waters of the State.

"We now have 131 boating access areas in operation," said Bill Jansen, assistant chief of the Commission's Division of Boating. "We've built 20 new areas since July of 1973 but we don't feel that we're anywhere near the saturation point, especially when you consider the amount of water and the number of boaters in the State."

The typical new access area has a twin concrete launching ramp, a one-acre gravel parking lot and boarding docks. The areas are usually built by Commission personnel and the average cost of an area is now about $10,000. The construction of new areas is funded mainly by monies from the Commission's motorboat registration fees; no general tax monies or funds from the sale of hunting and fishing licenses are used to help build access areas. The sites of the access areas are either on land the Commission owns or on land donated or leased to the Commission for the purpose of building an access area.

	Access Areas	Location
1	Alligator River (East Lake Ferry)	North side of East Lake Bridge
2	Alligator River (Gum Neck Landing)	SR 1316, 20 miles south of Columbia
3	Alligator River (Frying Pan)	End SR 1307, 13 miles southeast of Columbia
4	Apalachia Lake	Below Hiwassee Dam on south side
5	Badin Lake (Beaver Dam)	SR 2551, 15 miles south of Denton
6	Badin Lake (Lakemont)	On SR 1158 in Lakemont
7	Bear Creek Lake	SR 1137 off NC 281, five miles east of Tuckaseigee
8	Big Flatty Creek	SR 1108, six miles from Weeksville
9	Big Swamp Creek (Lennon's Bridge)	SR 1002 at Lennon's Bridge
10	Black River (Hunt's Bluff)	SR 1547, south of NC 53, eight miles east of Kelly
11	Black River (Ivanhoe)	SR 1100 just south of Ivanhoe
12	Blewett Falls Lake (Pee Dee)	SR 1748, two miles north of Pee Dee River Bridge on US 74
13	Blewett Falls Lake (Grassy Island)	SR 1148, five miles west of Ellerbe
14	Bogue Sound (Morehead City)	East side of US 70 near west city limits
15	Brices Creek	SR 1143 in Croatan National Forest
16	Cape Fear River (Elwell's Ferry)	SR 1730 at Elwell's Ferry
17	Cape Fear River (Tarheel)	SR 1316, one mile northeast of NC 87
18	Cape Fear River (Avent's Ferry Bridge)	NC 42, two miles southwest of Corinth
19	Cape Fear River (Fayetteville)	NC 87, four miles south of Fayetteville
20	Cape Fear River (Lillington)	SR 2016, three miles east of Lillington
21	Federal Point (Cape Fear River Basin)	End of US 421 near Fort Fisher
22	Cedar Cliff Lake	SR 1135 east of NC 107 at Tuckaseigee
23	Chatuge Lake (Jackrabbit)	US 64 east of Hayesville to SR 1154 south to SR 1155
24	Chatuge Lake (Ledford's Chapel)	Five miles east of Hayesville via US 64 and SR 1151
25	Cheoah Lake	Adjacent to NC 28
26	Chowan River (Cannon's Ferry)	SR 1231, one mile from NC 32, 13 miles north of Edenton
27	Chowan River (Edenhouse Bridge)	US 17 at Edenhouse Bridge
28	Chowan River (Tunis)	NC 1402 in Hertford County
29	Conaby Creek	NC 45, three miles north of US 64
30	Contentnea Creek (Snow Hill)	One block east of US 258 in Snow Hill
31	Contentnea Creek (Grifton)	In Grifton on Contentnea Creek
32	Currituck Sound (Poplar Branch)	End of NC 3, off US 158 north of Grandy
33	Dan River (Milton)	NC 62 just northwest of Milton
34	Dan River (Leaksville)	NC 14, one mile from Leaksville
35	Dawson Creek	SR 1302, four miles southwest of Oriental
36	Deep River (Carbonton)	SR 1621 just south of Carbonton
37	Deep River (Sandy Creek)	US 64, one-half mile west of Ramseur
38	East Lake (Mashoes)	SR 1113, three miles north of Manns Harbor
39	Fontana Lake (Cable Cove)	US Forest Service Cable Cove Campground on NC 28
40	Fontana Lake (Tsali)	North on US Forest Service Road from NC 28 at Graham-Swain County line
41	Gaston Lake (Summit)	SR 1458, one mile north of US 158
42	Gaston Lake (Henrico)	SR 1214, seven miles west of NC 46
43	Gaston Lake (Stonehouse Creek)	SR 1357, four miles north of Littleton
44	Hancock Creek	SR 1717, two miles off NC 101, four miles east of Havelock
45	Lake Hickory (Steel Bridge)	SR 1141 at Steel Bridge
46	Lake Hickory (Gunpowder)	SR 1757, one mile north of Grace Chapel Road
47	Lake Hickory (Lovelady)	SR 1757, one mile south of Grace Chapel Road



"One problem we have with access areas is that people don't understand their purpose," said Jansen. "They aren't meant to be a park or picnic ground, or even a fishing area. They are simply intended to be places to launch a boat and take it out. Funding limitations prohibit us from providing other recreational services at the areas."

It usually takes around two months of working time to complete the construction of an access area. While all parts of the State could use more boating access areas, Jansen says the need is especially acute in the Coastal Region around the sounds.

Sadly enough, there is one major problem facing the Boating Access Area Program. That problem is vandalism.

"Repairing vandalism in existing areas takes up a significant portion of our maintenance budget," Jansen said. "We could probably build two new areas per year with what we spend repairing damage caused by vandals. And it's not only a matter of money, it's also a matter of time. We have 18 men statewide to maintain 131 access areas and over 500 floating aids to navigation, so our time is spread pretty thin. We shouldn't have to spend it repairing needless damage.

Recently, several vandals who were damaging a boating access area were apprehended and brought to court. The men were fined, and ordered to make restitution for damage to the Wildlife Commission. Those

Access Areas		Location
48	Lake Hickory (Oxford)	Lake Hickory Campground Road
49	High Rock Lake (Southmont)	SR 1100, one mile south of Southmont
50	High Rock Lake (Dutch Second Creek)	SR 1002, eight miles southeast of Salisbury
51	Hiwassee Lake (Grape Creek)	SR 1326, five miles northwest of Murphy
52	Hiwassee Lake (Hanging Dog)	SR 1326, three miles northwest of Murphy
53	Intracoastal Waterway (Cedar Point)	NC 24, one mile north of Swansboro
54	Intracoastal Waterway (Coinjock)	SR 1142, one mile east of Coinjock
55	Intracoastal Waterway (Snow's Cut)	Near Carolina Beach, one mile east of US 421 at bridge
56	Intracoastal Waterway (Wrightsville Beach)	Adjacent to US 74-76 drawbridge over Intracoastal Waterway
57	Intracoastal Waterway (Turkey Creek)	SR 1530, one mile south of SR 1529
58	Intracoastal Waterway (Taylor's Creek)	Front Street in Beaufort
59	Lake James (Canal Bridge)	NC 126, two miles northwest of Bridgewater
60	Lake James (Linville River)	NC 126, one mile east of Linville River Bridge
61	Lake James (Hidden Cove)	NC 126, one-half mile south of Catawba Spillway
62	Lake James (North Fork)	One-half mile north of US 221-70 intersection west of Marion via SR 1501 and 1552
63	Kerr Lake (Bullocksville)	SR 1366, four miles west of Drewry
64	Kerr Lake (Henderson Point)	SR 1359, two miles from SR 1356
65	Kerr Lake (Hibernia)	SR 1347, two miles from NC 39, one mile north of Townsville
66	Kerr Lake (Satterwhite Point)	SR 1319, five miles north of I-85
67	Kerr Lake (County Line)	SR 1242, one-half mile from SR 1361
68	Kerr Lake (Kimball Point)	SR 1204, two miles from SR 1200, five miles north of Drewry
69	Kitty Hawk Bay (Avalon Beach)	At Avalon Beach, one-half mile west of US 158
70	Little River (Hall's Creek)	Between Nixonton and US 17 on SR 1140
71	Lookout Shoals Lake	SR 1006 near Lookout Dam
72	Lumber River (Wagram)	US 401, one mile northeast of Wagram
73	Lumber River (High Hill)	US 74 at south end of Lumberton at bridge
74	Lumber River (McNeil's Bridge)	NC 72 just northwest of US 301 Bypass
75	Meherrin River (Murfreesboro)	North side of bridge on US 258 in Murfreesboro
76	Mountain Island Lake (River Bend)	NC 16, 12 miles northwest of Charlotte
77	Mountain Island Lake (Davidson Creek)	SR 2165 off SR 2074, 12 miles northwest of Charlotte
78	Nantahala Lake (Choga Creek)	East of Andrews via SR 1505 and US Forest Service Road #30
79	Nantahala Lake (Rocky Branch)	19 miles west of Franklin via US 64 and SR 1310
80	Neuse River (Bridgeton)	US 17, one mile north of Bridgeton

The Wagram Access Area on the Lumber River is a popular launching site for canoeists. Statewide, there are 131 free boating access areas which can accommodate boats of all shapes and sizes.

Rick Estes

wishing to report incidences of vandalism to a boating access area should contact their local police, wildlife enforcement officer, or call the Commission's Toll Free Hot Line in Raleigh at 800-622-7137.

Mark Taylor is assistant editor of WILDLIFE IN NORTH CAROLINA.

Access Areas	Location
81 Neuse River (Richardson's Bridge)	SR 1201, nine miles southeast of Smithfield
82 Neuse River (Kinston)	Neuse River Bridge on US 70 West in Kinston
83 Neuse River (Goldsboro)	US 117 south of Goldsboro
84 Neuse River (Cox's Ferry)	Wayne County Road 1224, nine miles west of Goldsboro
85 New River (Jacksonville)	New River Bridge on US 17 in Jacksonville
86 Northeast Cape Fear River (Kenansville)	NC 24 between Kenansville and Beulaville
87 Northeast Cape Fear River (Castle Hayne)	US Highway 117 bridge over Northeast Cape Fear River
88 Northeast Cape Fear River (Holly Shelter)	At Holly Shelter Refuge, six miles south of NC 53
89 Northeast Cape Fear River (Sawpit Landing)	End of SR 1512 off NC 53, three miles north of Burgaw
90 Pamlico River (Smith's Creek)	NC 33 in Goose Creek Game Lands, two miles west of Hobucken
91 Pamlico Sound (Stumpy Point)	End of SR 1100 in Dare County
92 Pamlico Sound (Englehard)	East of US 264 at north town limits of Englehard
93 Pasquotank River (Elizabeth City)	Knobb Creek Road off US 17 north of Elizabeth City
94 Pee Dee River (Red Hill)	NC 109, eight miles north of Wadesboro
95 Pee Dee River (Blewett)	SR 1141, four miles from SR 1140, four miles west of Rockingham on US 74
96 Pee Dee River (Rockingham)	US 74, six miles west of Rockingham
97 Perquimans River (Perquimans)	SR 1319, one mile from SR 1300, nine miles east of Hertford
98 Rhodhiss Lake (John's River)	NC 18, four miles north of Morganton
99 Rhodhiss Lake (Castle Bridge)	SR 1001 at Castle Bridge north of Connelly Springs
100 Rhodhiss Lake (Dry Pond)	Dry Pond, one mile southwest of Granite Falls
101 Roanoke Rapids Lake (Thelma)	Two miles northeast of Thelma via SR 1400 and 1422
102 Roanoke Rapids Lake (Vultare)	End of SR 1213 off NC 46 south of Vultare
103 Roanoke River (Weldon)	US 301 at Weldon
104 Roanoke River (Hamilton)	In town limits of Hamilton
105 Roanoke River (Gaston)	NC 48 Bridge north of Roanoke Rapids
106 Roanoke River (Plymouth)	Highway 45 Bridge east of Plymouth
107 Santeetlah Lake (Avey Creek)	11 miles west of Robbinsville, turn left on Forest Service Road, five miles to area
108 Santeetlah Lake (Ranger Station)	SR 1127, five miles west of Robbinsville
109 Scuppernong River (Columbia)	US 64, one mile west of Columbia
110 Shelter Creek	SR 1523, one-quarter mile off of NC 53, nine miles east of Burgaw
111 Smith's Creek (Oriental)	NC 55 Bridge in town limits of Oriental
112 South River (Ennis Bridge)	SR 1007, one mile east of NC 41
113 South River (Sloan's Bridge)	US 701, two miles southwest of Garland
114 South Yadkin River (Cooleemee)	SR 1116, two miles northwest of Cooleemee
115 Tar River (Bell's Bridge)	Bell's Bridge on NC 44, one mile north of Tarboro
116 Tar River (Old Sparta)	NC 42 at Old Sparta
117 Tar River (Rocky Mount)	Adjacent to Business US 301 in Rocky Mount
118 Tar River (Falkland)	SR 1400 off NC 43, one mile east of Falkland
119 Tar River (Greenville)	SR 1533, one-half mile north of NC 33, one mile east of Greenville
120 Lake Tillery (Lilly's Bridge)	Take right on SR 1110 from NC 731, five miles west of Mt. Gilead
121 Lake Tillery (Swift Island)	NC 27-73, five miles southeast of Albemarle
122 Lake Tillery (Norwood)	SR 1740, one mile from Norwood
123 Lake Tillery (Stony Mountain)	Lighthouse Marina Road, five miles east of Albemarle via NC 24, 27 and 73
124 Tuckertown Lake (High Rock)	Davidson County Road 1002, four miles west of Healing Springs
125 Tuckertown Lake (Flat Creek)	SR 2148, three miles north of NC 49
126 Lake Waccamaw	Lake Shore Road west of NC 214
127 Lake Waccamaw (Big Creek)	SR 1947 on northeast shore of Lake Waccamaw
128 Waccamaw River	NC 904 Highway Bridge in Brunswick County
129 White Oak River (Haywood's Landing)	South of NC 58, five miles southeast of Maysville
130 Lake Wylie (Copperhead)	SR 1333, one mile from Pine Harbor Road
131 Yadkin River (Concord Church)	Access Road, one-half mile southeast of NC 801

Letters

Dear Sir:

This letter is in regards to a letter printed in the November 1978 issue of Wildlife In North Carolina magazine. This letter was sent by Jacquelin D. Nash of Tarboro, North Carolina concerning the sighting of a bald eagle this past summer.

Mrs. Nash wonders if anyone else has seen an eagle in this same neighborhood and if this eagle was possibly looking for a nesting place. I am very confident that he was not looking for a nesting place, because I feel he already permanently resides in the area of Blounts Bay. I say this because I have spotted a mature bald eagle in this area three separate times in the last eleven years. My friends and I have had a duck blind located about one-half way up the eastern shore of Blounts Bay going toward Mauls Point. During the many hours that I have spent working on my blind and actually duck hunting, I have viewed an eagle (not knowing, of course, if it was the same one) several times, the last being in the fall of 1977.

I know that this was probably a rare thing but I was unaware that possibly no one else knew of the eagle's residence in this area. Because of this, I was motivated to write you.

I would, of course, be open to correspondence if anyone is interested. Keep up the good work.

Richard L. Tucker
Greenville

Dear Sir:

You and your readers might be interested in an account about a big "cat" my wife saw as she and I walked down a game trail on some land we use about six miles south of Littleton.

At the time, from habit, I was looking at the ground to be sure we would not step near a copperhead.

My wife was looking ahead for some wild grapes which I'd told her were ripe and pretty good at this time of year (Sept. 29th).

She stopped suddenly and then I heard a heavy "thud" as if a heavy body had jumped from a tree to the leaf-covered ground about 45 or 50 feet away.

At first I thought it was a deer, but a deer would not be in a tree and the animal was not bounding away like a deer. It sounded more like a big hog running – but it could not be that.

My wife could not speak at first, but grabbed me and said, "It's a black panther."

Then she said it looked like a monkey in the tree but more cat like. The animal's face was turned away as it crouched and jumped to the ground.

She was frightened and I took her to our pickup truck about 200 feet away. She got in and rolled up the windows.

I could not believe it to be a panther and went back.

I found a place where some animal had been sleeping or had brushed aside the leaves. It could have been where a deer had been eaten and then dragged away for the leaves were full of deer hairs and something had been dragged over a place near it.

My wife did see a big, very dark cat. I heard it jump to the ground very near us.

The running through the leaves was as if it were a good size animal with shorter legs than a hog and in no great hurry to get away.

Clifton C. Alston
Littleton

Dear Sirs:

Possibly I am the only person in Maine receiving "Wildlife in North Carolina." But may I say that your December, 1978, issue was one of your most interesting. The photography was superb and every article very interesting, even to one who has been only to Raleigh on two very short visits.

Deborah C. Nichols
York, Maine

Dear Sirs:

We, as concerned citizens, are writing to protest the B. Everett Jordan Dam project.

We feel that the proposed lake will do nothing for the people of North Carolina, because it will destroy a life scheme that can be found only in certain areas of the country. The Army Corps of Engineers tell us that we will benefit from the lake, which is going to cost upstream industries and municipalities $3,000,000 annually above present sewage treatment costs. This amount does not include the price of the project itself. Even after the lake has been built, its water quality will be so poor as to be unfit for contact recreation and few, if any, fish will live in it. Thus, the lake cannot be used for total recreation or as a water source for municipalities.

At the present time, the river is used by fishermen, canoeists, rafters, tubers, and other outdoor people. When the B. Everett Jordan project is completed, the lake will support none of these people.

We, as concerned citizens, feel that the B. Everett Jordan project is not in the best interest of the people of North Carolina. Attached is a petition signed by 54 people.

Mike Gray
Kinston

Dear Sir:

On December 29th, I went to Bodie Island to hunt. I am only eighteen years old and, needless to say, I was very impressed with the whole setup. I have been hunting eleven years and have been many places, but I never have seen anything to match this. I think the park management deserves a pat on the back because they do an excellent job. Unfortunately, my luck was not so good, but I did have an excellent time.

There is one thing that bothered me. There were three drink cans, countless potato chip bags and candy wrappers, a 64 ounce drink bottle, and bucket left in the blind. This list does not include the hundred shell hulls that were left on the hummock. My brother and I picked up and carted away what we could, but unfortunately, we couldn't get it all.

There is only one kind of person to blame this on and that is the slob. I find the main problem is the person who will leave a drink can and say that no one will know the difference.

I am making an appeal to the sportsmen of North Carolina: Let's pitch in and see if we can't correct some of this by doing the following:

(1) Pick up your trash, your hulls, and any other debris you leave.
(2) Pick up what you can of the trash others have left.
(3) If you see anybody leave trash behind, tell the authorities.

Bodie Island is not the only place where this happens. It happens in the marshes, in the swamps, and on the rivers. I don't know of any way we can completely stop it but we can do our part. They say "Courtesy is contagious," so let's see if we can start an epidemic.

Ernest D. Brame
Kinston

Nantahala Access Site Purchased

The U.S. Forest Service recently purchased a 210-acre site on the Nantahala River from the Nantahala Power and Light Company to be used as an access area. The site is at the intersection of U.S. Highway 19 and the Wayah Road (SR 1310), adjoining the grounds of the Nantahala powerhouse. The site is near an access area currently operated by the Forest Service where traffic congestion problems are occurring.

Construction of the new access area is expected to start this summer. Facilities will include a parking area, toilet facilities and a new boat access site. Work will be done by the Young Adult Conservation Corporation and Older American work crews.

The new area will provide the public with better access to one of the most spectacular mountain gorges in the east.

Honeybees Are In Trouble

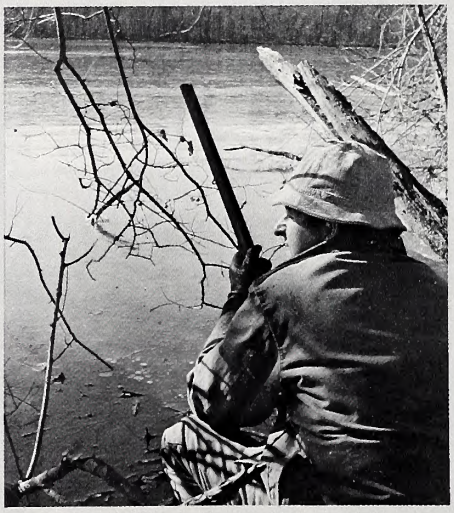
Honeybees are in trouble, according to a recent article in *Michigan Natural Resources Magazine*. If this doesn't seem especially alarming, consider the fact that one-third of the average American diet depends directly or indirectly upon honeybee related crops. Six percent of the United State's agricultural production is at least indirectly dependent upon honeybee pollination, and the value of these crops comes to about $3.5 billion.

The problem with the bees is pesticides. Two percent more bees die from pesticide poisoning each year than can be replaced by reproduction. Unlike some other insects, bees do not develop a high resistance to pesticides and die from doses of less than one-millionth of an ounce. They contract pesticide poisoning while collecting nectar and pollen from flowering plants, or while flying through pesticide clouds that can drift for miles.

Commission Contributor To DU To Preserve Waterfowl Habitat

The N.C. Wildlife Resources Commission recently contributed $8,573 to Ducks Unlimited to help preserve valuable waterfowl breeding areas in the Canadian arctic and prairie provinces. The funds come from an allotment of $1 taken from the sale of all non-resident hunting licenses sold within North Carolina as mandated by the legislature in 1970. The Commission has donated over $78,000 to Ducks Unlimited since the practice started.

Ducks Unlimited is a conservation organization dedicated to preserving valuable waterfowl breeding habitat in Canada. The organization was formed in 1937 when a handful of conservationists became concerned about dwindling waterfowl numbers. At the turn of the century, waterfowl populations of all species totaled about 200 million birds. By the end of the 1930's, market hunting, heavy sport shooting, habitat destruction, and a devastating dust bowl on the Great Plains had all played their part, and waterfowl populations had plummeted to around 25 million birds. Since that time, Ducks Unlimited has spent over $60 million to preserve habitat in Canada, and now has over a half-million acres of land within its refuge system. Ducks Unlimited confines its work to Canada, because that's where most of the continent's waterfowl originates.



"The breeding grounds in the Canadian prairie provinces and in the arctic regions produce 70 to 75 percent of North America's waterfowl," said Jim Shepard, director of operations for Ducks Unlimited. "When you consider the value of these breeding grounds, it's vitally important that conservationists protect them."

Waterfowl populations have recovered from the low point they reached in the 1930's and have now stabilized at around 100 to 125 million birds of all waterfowl species. Still, the days when waterfowl darkened the skies may be gone forever because too much breeding habitat on the Great Plains has already been drained and too many marshes where the birds wintered over have fallen to the bulldozer. But sportsmen and conservationists have stabilized waterfowl populations and ensured that ducks and geese won't go the way of the passenger pigeon.

October Enforcement Report

For the month of October, 1978, the N.C. Wildlife Resources Commission checked a total of 23,768 hunters and fishermen and 1,055 boaters.

Of the hunters and fishermen, 737 were prosecuted and 642 convictions were obtained. The total fines collected were $225 and the total costs collected were $15,031.

Of the boaters, 351 prosecutions were made and 314 convictions were obtained. Total fines collected were $872 and total costs collected were $7,520.

Other prosecutions totaled 35 and convictions totaled 31. Total fines collected were $412 and total costs collected were $624.

All fines and any arrests or witness fees were paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected were paid to the N.C. Wildlife Resources Commission or its personnel.

S.I.N. Spill Hits Roadside

All of the recent news concerning PCB spills reminded Pete Kornegay, a Commission fisheries biologist from Camden, of an incident which happened to him last year. Pete was returning from a fish kill investigation at Kitty Hawk when the incident occurred, and his account of the event follows:

"With thoughts of pesticides and toxic substances still on my mind, I came up behind an old, dilapidated pickup truck. Mounted on the back of this pickup was a tremendous tank with a pipe extending from the bottom of the tank out the back of the truck. The drain plug had been removed, and a liquid was pouring out onto the road.When we crossed Indiantown Creek in Camden County, I could just imagine that liquid finding its way into the creek and causing a massive fish kill. When the truck pulled into a country store, I decided it was time to ask a few questions."

"I pulled in behind the truck and approached the driver and two passengers, who were very neatly dressed to be hauling such a load. When I asked what they were dumping onto the road, the driver smiled and said, "Sir, the only thing in that tank is water and a whole lot of sin!" Sure enough, the tank was a portable baptismal, and these guys had just finished baptising services at a local church. I turned red, apologized, and went on my way."

Wildlife Week

"Conserve Our Wildlife" is the theme for National Wildlife Week, which runs from March 18 through March 24. The theme emphasizes the vital role sound conservation practices play in maintaining healthy populations of all wildlife species. This makes the 42nd consecutive year that the National Wildlife Federation has sponsored the event.

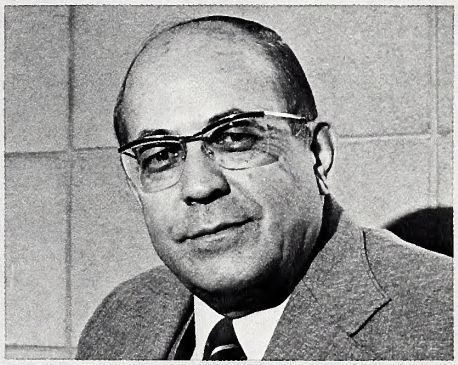
Wildlife Committee Chairmen Seek Input From Sportsmen

Many important pieces of wildlife legislation are currently being introduced in the North Carolina General Assembly. The Wildlife Committees of both the Senate and the House of Representatives will be instrumental in guiding these measures, and the input of North Carolina's sportsmen and other citizens interested in the wise use of our wildlife resources is valued by these committees. Listed here are the chairmen of the two Wildlife Committees. Both of these men welcome your comments and observations on pending wildlife legislation. Addresses and phone numbers at which they may be reached are listed.

Conrad R. Duncan, Jr., Chairman of the Senate Wildlife Committee
Home address: Box 282, Stoneville, N.C. 27048. Home phone: AC 919, 623-9166
Legislative Office Address: Room 2014, N.C. Legislative Building, Raleigh, N.C. 27611. Legislative Office phone: AC 919, 733-5664

Senator Duncan operates the C.R. Duncan Construction Company, which specializes in road building and bridge construction. He is married to the former Rebecca Tuttle, and they have four children. Senator Duncan is active in the United Methodist Church, is a 32nd degree Mason, served in the U.S. Air Force, and presently is serving on the Board of Trustees of Rockingham Community College.

He has served two terms in the N.C. House of Representatives and one term in the Senate. He presently serves on nine legislative committees, including the Senate Wildlife Committee, of which he is chairman, and the Finance Committee, of which he is vice chairman. He enjoys a variety of outdoor sports but is partial to coon hunting. Senator Duncan is also an avid gun collector.



James E. (Jim) Lambeth, Chairman, House Wildlife Committee
Home Address: 201 East Holly Hill Road, Thomasville, N.C. 27360. Home phone: AC 919, 475-3025
Legislative Office Address: Room 1009, N.C. Legislative Building, Raleigh, N.C. 27611.
Legislative Office phone: AC 919, 733-5863.

Representative Lambeth is secretary-treasurer of Erwin-Lambeth, Inc., of Thomasville. He is a graduate of Duke University and Harvard Business School. He is active in the Boy Scouts of America (from which he received the Silver Beaver Award), Rotary International, and many boards, agencies and councils, both on a local and national level. He currently serves as director, Home Building and Loan Association; director, N.C. National Bank, and is past director, Piedmont Associated Industries.

Representative Lambeth is married to the former Katharine Evermond Covington, and they have four children. He and his family attend the Thomasville United Methodist Church. Representative Lambeth is serving his second term in the N.C. House of Representatives, and is currently on six legislative committees, including Highway Safety, of which he is vice chairman, and Wildlife, of which he is chairman. Hobbies and outdoor sports which he enjoys include hunting, fishing and golf.

Hearings On Hunting Set

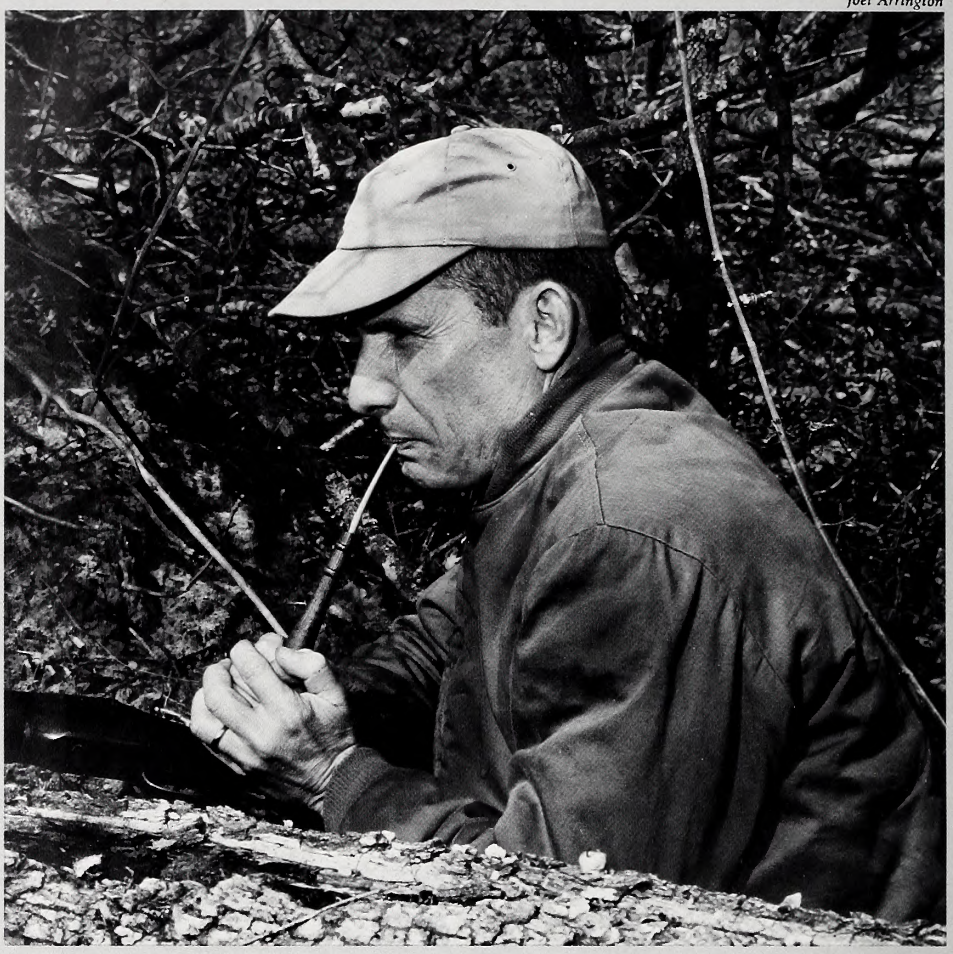
A series of nine public hearings on the proposed 1979-80 hunting and trapping hearings will be held throughout the State during the first two weeks of April.

For information on the date and location of the hearing in your area, consult your local newspaper or contact an area wildlife enforcement officer or biologist.

Turkey Season Looking Good

Biologists Predict Good Spring Gobbler Season

Joel Arrington



The outlook for this year's spring wild turkey season is good, according to biologists from the N.C. Wildlife Resources Commission.

"The outlook for this year's turkey season is better than it has been in some time," said Wayne Bailey, head of the Commission's wild turkey program. "Reproduction has been good for the last two years, and we're getting wild turkey sightings from areas where they haven't been seen in years. This spring's harvest should be higher than it has been the last two years, and the mountain kill should also be up quite a bit. Populations in our mountain release areas are excellent."

According to Bailey, last year's low kill was due to poor weather and heavy hunting pressure in some areas, while other areas were neglected.

There are several steps hunters can take to help the commission with the wild turkey program. One is to follow legal requirements to tag and check each kill, and the other is to curb illegal hunting during the fall and winter by reporting violators.

"Checking your bird is especially important to us," Bailey added. "The harvest figures give us the best idea of whether the turkey population in an area is expanding or declining, and also show us the general health of the birds.

Hunters should also report any illegal hunting. Poaching during the fall and winter is one of the most destructive influences affecting turkey populations. Hens are most likely to be shot at this time of year. The N.C. Chapter of the Wild Turkey Federation also offers a reward to anyone offering information leading to the arrest and conviction of turkey poachers."

"Our ultimate goal is a fall either-sex season for turkeys when the population warrants it," Bailey concluded, "but we're probably years away from that now."

The wild turkey season opens on April 7 and runs through April 28 in and east of Rockingham, Forsyth, Yadkin, Iredell, Catawba, Lincoln and Gaston counties, except at Camp Lejeune where the season is April 7 through May 5. There is no open season in Bladen, Brunswick, Columbus, Cumberland, Gates, Harnett, Hoke, Robeson, Sampson and Scotland counties.

The season opens on April 14 and runs through May 5 in and west of Stokes, Surry, Wilkes, Alexander, Caldwell, Burke and Cleveland counties. Only bearded birds may be taken and the daily bag limit is one bird with a maximum of two per season and two in possession.

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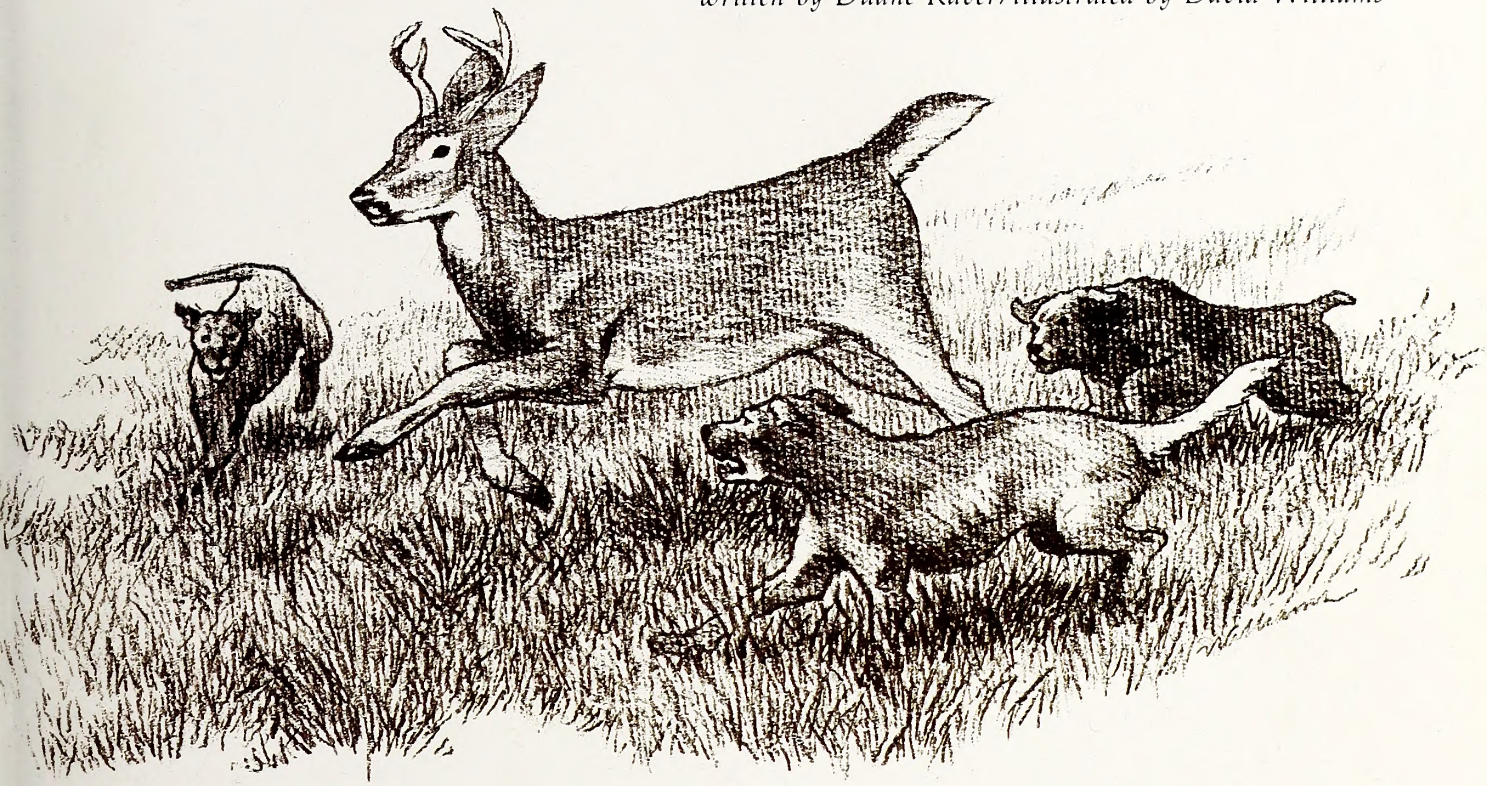
Nature's Ways

Fury On The Loose

written by Duane Raver/illustrated by David Williams



Unless you've seen a pack of "wild dogs" slash through a deer herd, or an abandoned pet smash a nest of quail eggs, it's hard to realize the magnitude of this problem to our wildlife populations. Even the source of the damage — the dogs and cats that roam the countryside — is difficult to define and pin down.

There's little doubt that these animals had their origins as pets. Many of them have been abandoned by their owners and simply have had to turn to wildlife as a food supply. Learning to kill usually is no problem for them, and instincts dormant since the early days of their wolf ancestors soon take over. Even the "pack" trait comes naturally, and dogs of various types come together to travel and hunt as a unit. Abilities to track and capture prey are sharpened through necessity; the dogs and their offspring born and raised as wild things soon develop into efficient killers. Some dogs and cats even go beyond providing food necessary for living, and become wanton killers, apparently seeking out prey and destroying it for the sheer joy of killing.

Although the victims of the wild dogs are often the weak, crippled or old; newborn fawns, does ready to bear young, and most nesting wildlife are particularly vulnerable to these attacks. Dogs and cats upset the balance even further by taking wildlife that otherwise would help produce a crop to be harvested under wildlife management programs. It is a serious problem for the wildlife manager, and one that goes unseen by most sportsmen and the general public.

The statewide extent of the kill and damage is difficult to calculate and document, and a solution to the problem is even more difficult to determine and carry out. It would appear that educating all people and soliciting their aid in keeping their pets under control is fundamental to this solution. Destroying unwanted pets isn't easy, but this must be considered rather than the alternative of simply "dumping" a dog or cat along the road to develop into a potential wildlife killer.

Dog control wardens in each county have been suggested by some as a possible aid to this problem. It has worked fairly well in some areas, yet has helped very little in other situations. Perhaps it is worth reconsideration as a means of wild dog control.

The dramatic attack of the dog pack on a helpless doe or fawn is sometimes observed. Yet the insidious snatching of a young quail by a stray cat goes unnoticed. Even the "house cat," while by no means wild, is an efficient predator on upland game and songbirds and needs to be controlled. The dog left to roam during the nesting seasons of quail, rabbits, and turkeys can do considerable damage by breaking up nest after nest, many of which will not be reestablished.

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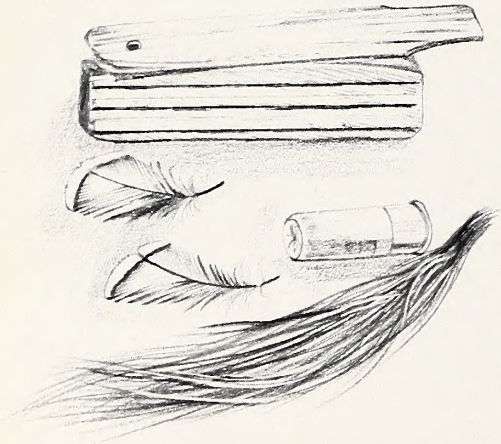

Spring Flock

Ever watchful, a bronze gobbler herds his harem from a pine woods into a sun-dappled field. Remnants of last fall's mast and seed crops are gleaned from the woodlands and fields. Soon, tender spring shoots and stirring insects will provide nutritious diets for gobblers and nesting hens.

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Our Natural Heritage

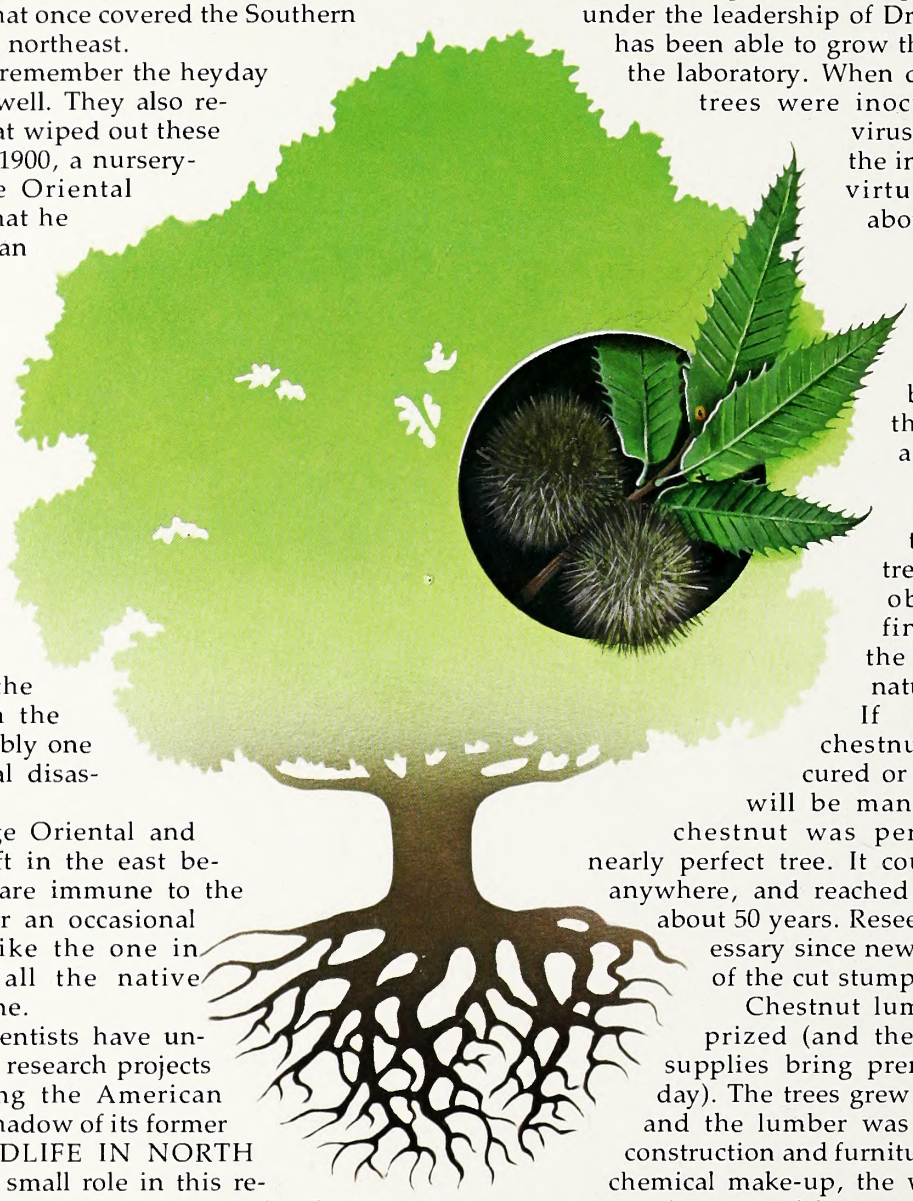
by Jim Dean

illustration by David Saholsky

Hope For The American Chestnut

Deep in the hardwood forests of Wilkes County, there stands a lone American chestnut that soars over 80 feet above the ground and measures 33 inches through the trunk. It is the largest American chestnut still living in the southeast, a stalwart remnant of the massive native chestnut forests that once covered the Southern Appalachians and the northeast.

Many older people remember the heyday of the chestnut very well. They also remember the blight that wiped out these magnificent trees. In 1900, a nurseryman imported some Oriental chestnuts, unaware that he was also introducing an exotic fungus for which the native American chestnuts had no resistance. Spores from the fungus spread rapidly; and by 1914, chestnuts in New York, Pennsylvania, Virginia and West Virginia were all dead or dying. By 1930, the blight had killed almost all the chestnuts from the Great Lakes through the South — unquestionably one of the great ecological disasters on record.



There are still large Oriental and Spanish chestnuts left in the east because these imports are immune to the blight, but except for an occasional remaining tree — like the one in Wilkes County — all the native chestnuts are long gone.

In recent years, scientists have undertaken a number of research projects in hopes of returning the American chestnut to at least a shadow of its former glory. Indeed, WILDLIFE IN NORTH CAROLINA played a small role in this research by conducting a survey — now completed — to find large surviving trees. Though most of the reported chestnuts turned out to be either sterile or blight immune imports, the Wilkes County tree was discovered.

Until recently, much of the research centered around finding a blight resistant mutation or creating such a mutation through hybridization or radiation. Now, at last, it appears that there may have been a breakthrough.

At a symposium at West Virginia University in January, researchers from Europe met with their American counterparts to share their findings. The most interesting results were reported by the Italians and French. Scientists in these countries have learned that the blight, which is really a fungus (*Endothia parasitica*), is susceptible to a virum known as hypovirulent which can seriously weaken it.

The Connecticut Agricultural Experiment Station, under the leadership of Dr. Richard Jaynes, has been able to grow the blight virus in the laboratory. When diseased chestnut trees were inoculated with the virus, the cankers on the infected trees were virtually cured in about two months.

Experiments are now under way to study several different strains of blight virus, and the initial results are promising. Already, it is clear that individual trees can be treated, and the big obstacle now is finding a way for the virus to spread naturally.

If the American chestnut blight can be cured or controlled, there will be many benefits. The chestnut was perhaps the most nearly perfect tree. It could grow almost anywhere, and reached sawlog sizes in about 50 years. Reseeding was unnecessary since new sprouts rose out of the cut stump.

Chestnut lumber was highly prized (and the few remaining supplies bring premium prices today). The trees grew straight and tall, and the lumber was widely used in construction and furniture. Because of its chemical make-up, the wood was nearly rot resistant, and homes, barns and fence posts have outlasted the men who cut the lumber.

Chestnut wood and bark is also rich in tannin; and as such, was valuable to the leather industry. Significantly, chestnut was also superior to pine for papermaking.

Nor did its benefits end there. The trees were never frost-killed because they bloomed in late June or early July, and therefore, there was always an abundant supply of nuts for wild turkeys, deer, bears, squirrels and other game animals and birds. Indeed, there is a strong belief among some biologists that the disappearance of the native chestnut forests may have played a very significant role in the decline of certain wildlife species in the early part of this century.

WILDLIFE IN NORTH CAROLINA

"Wildlife in North Carolina" is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

April, 1979

Volume 43, No. 4

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Department of
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Community Development

Howard N. Lee, Secretary

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Nature's Ways *By Duane Raver*

Cover *Photography By Harry Ellis*
The red salamander is one of many species found in the damp forests which cover North Carolina's mountains.

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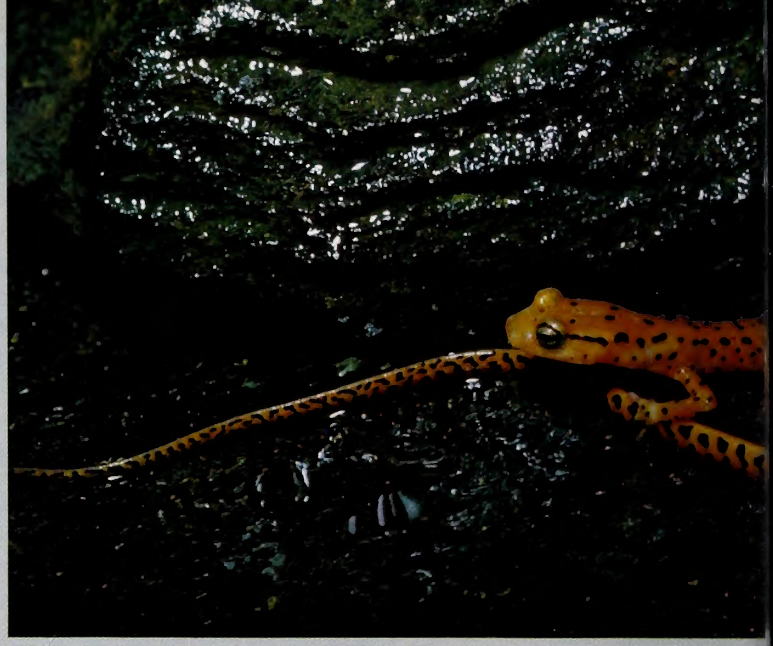
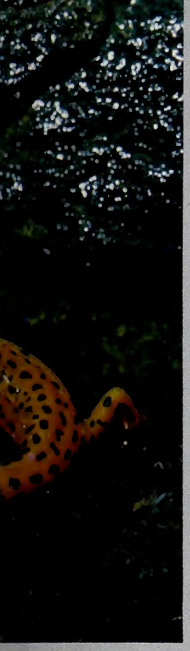


There are more different species of salamanders in North Carolina than anywhere else in the world.

A World Of Salamanders

Written and Photographed By Harry Ellis



The heavily forested slopes and summits of North Carolina's highest mountains provide essential habitat for many species of salamanders which like the rich soil and damp climate. This undisturbed forest floor (lower left) is ideal for salamanders. The long-tailed salamander is one of the most colorful species (left), and its tail makes up two-thirds of its total length. Red-cheeked salamanders (below) are one of a number of species found only in the Great Smoky Mountains.

One summer evening near nightfall, I had the occasion to be in a remote wilderness area of the North Carolina mountains. It had been a day of intermittent rain, and low-hanging clouds brought the threat of more showers to come. Tired from the day's activities, I sank down to rest in a bed of moss near a huge lichen-blotched boulder. Save for the last-dying coals from my campfire, darkness deepened into an enveloping blackness.

At first there was only silence. Then I became aware of faint rustling and scurrying movements in the leaves around me. Switching on my flashlight, I found that the commotion was caused by a number of salamanders engaged in their nocturnal foodgathering, searching for worms, insects, spiders and other small creatures. Following the beam of my light, I was amazed. The forest floor was actually alive with salamanders. Dozens, perhaps even hundreds, representing half a dozen different species scampered over the ground. For a number of years I had been studying and photographing salamanders, but never had I seen such a concentration in one area.

North America has more kinds of salamanders than all other parts of the world put together. The southern Appalachian Mountains, including the Great Smokies and the Blue Ridge, represent the center of the world's salamander population. The North Carolina mountains have at least 25 definite species and 20 geographical races.

Through the years, many eminent herpetologists have come here to study and collect salamanders. The land itself is a region of great natural beauty, a primeval wilderness where massive sawtooth peaks rise from the blue mists and a million foaming waterfalls pour over dark ledges. The Cherokee Indians called these mountains *SAKANAHAGA* meaning in translation, "Blue Hills of the Great Spirit."

The great Pleistocene ice sheets that wiped out the plant and animal life over so wide an area of North America never touched these Carolina mountains and life continued to evolve and flourish undisturbed. With a mild climate, high annual rainfall and a wide diversity of ecological habitats, these highlands have been a great laboratory for the development of species and races, resulting in the earth's richest salamander fauna.

Belonging to the order *Caudata* (the tailed amphibians), salamanders are often incorrectly called "lizards" or "spring-lizards." They *do* have a certain external resemblance to lizards, are cold-blooded, with a tail and usually four short legs, but differ from true lizards by having moist, scaleless skins and toes devoid of claws. Their nearest relatives are the frogs and toads. With the ability of biological regeneration, they quickly grow replacements for lost tails and limbs.

Creatures of extreme adaptability, they live in every conceivable habitat — mountains, forest, marshes and bogs, rock crevices, streams and rivers, and some in the eternal night of caves and caverns. Each species has filled a specific ecological niche, an adaptability that has carried them through many millions of years of evolution.

Our salamanders range in size from the tiny Pigmy salamander (*Desmognathus wrighti*), an inch and a half in length, to the grotesquely ugly Hellbender (*Cryptobranchus alleganiensis*), reaching a length of over two feet. Found in clear-running Appalachian streams, it is now becoming scarce in some areas as these streams become polluted.

Unlike the ugly Hellbender, many of our salamanders are among the most beautiful of nature's creatures. Among these are the Red salamander (*Pseudotriton ruber*), its brilliant coloration giving it the appearance of an exotic creature from the tropics, the Mountain Spring salamander (*Gyrinophilus danielsi*), and the Red-Spotted Newt (*Notophthalmus viridescens viridescens*), which is strictly aquatic in the adult stage. The young Newt, hatched from an egg laid in the water, soon loses its gills, develops lungs and metamorphoses into a land-dwelling salamander now called a Red Eft. Bright red with black-bordered crimson spots, it is almost dazzling in brilliance. Remaining on land from one to three years, it then undergoes a final transformation to an aquatic adult. Losing its bright coloration and becoming yellowish brown or olive brown with red spots, it again enters the water, never to leave it again.

The thousands of streams and brooks that drain the slopes of these mountains are favorite habitats of many salamanders. For example, the Blue Ridge Two-Lined salamander (*Eurycea bislineata wilderae*) lives in

and along high mountain brooks. Here the female attaches her egg cluster to the underside of a boulder, remaining nearby until it hatches. The Long-Tailed salamander *(Eurycea longicauda longicauda)*, its tail almost twice as long as its body, is also found along brooks as well as in the twilight zone of limestone caverns where it is sometimes extremely abundant.

Some of our woodland salamanders (genus *Plethodon*) have a very restricted range. The gold-blotched Weller's salamander (*Plethodon welleri*) is found above 5,000 feet in the spruce-fir zone of only a few Appalachian summits. The Yonahlossee salamander (*Plethodon yonahlossee*) was named for a mountain road, originally an old Indian trail, in its limited range in the Blue Ridge Mountains. On the other hand, some are found over an extremely wide geographic area, like the Red-backed salamander (*Plethodon cinereus*) which is abundant throughout the Appalachians, from the lowest elevations to the highest mountain tops wherever there are forests and damp woodlands.

Methods of respiration vary. Some forms such as the Marbled and Spotted salamanders breathe by means of gills in the larval stage and by lungs as adults. However, the majority of our species belong to the family *Plethodontidae* (lungless), taking oxygen directly through their moist glandular skins and vascularized mouth linings and must avoid the direct rays of the sun, as rapid desiccation would result in death. Most are nocturnal in habits, though some are seen abroad on dark, damp days.

At the approach of winter, all our terrestrial forms retire to subterranean burrows below the frostline. Here in a state of lethargic torpor, with a greatly lowered metabolism, their response to external stimuli slowed and dulled, they will remain until "spring's alarm clock" calls them forth again. Some *aquatic* forms remain active during most of the winter. I have seen adult Red-spotted Newts swimming actively about in the ice-rimmed ponds of December.

There is often considerable variation in coloration and appearance between different geographical races within a species.

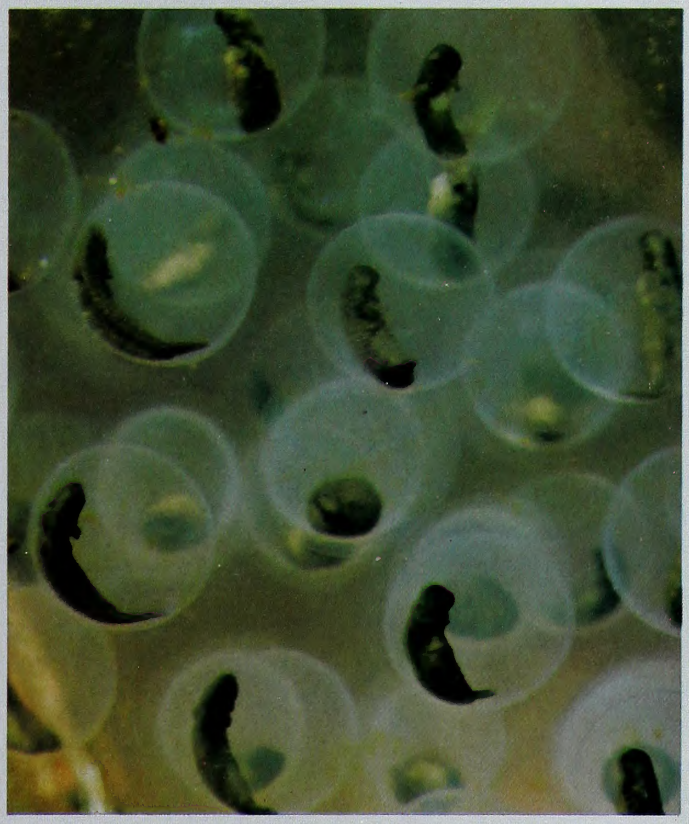
For example, we now know that the Red-cheeked salamander (*Plethodon jordani jordani*) found only in the Great Smoky Mountains, the Red-legged salamander (*Plethodon jordani shermani*) of the Nantahala Range a few miles southeast of the Great Smoky Mountains, and the Metcalf's salamander (*Plethodon jordani metcalfi*) with a plain, unmarked dark gray or black body, all represent three separate geographical races belonging to a single species.

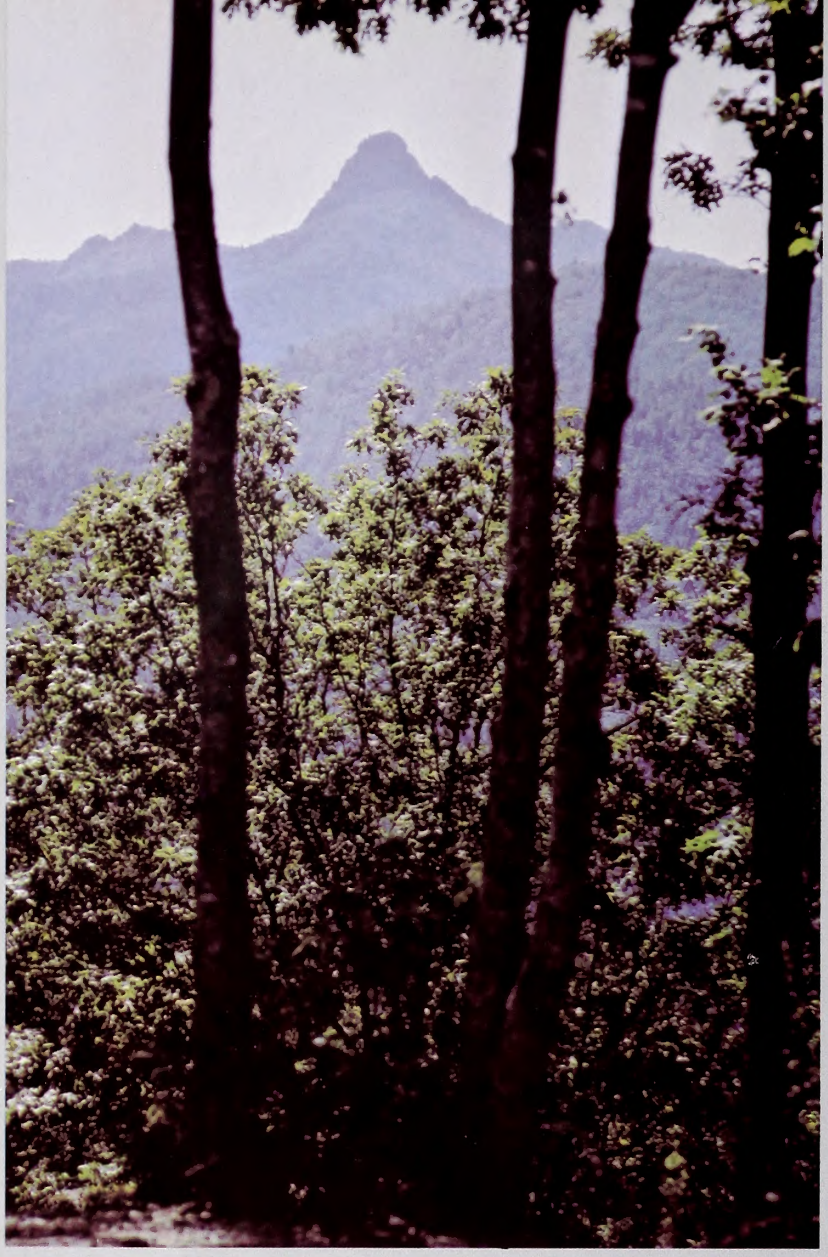
In the Blue Ridge Dusky salamander (*Desmognathus ochrophaeus carolinensis*), there is a greater variation in color and pattern among individuals than in any other American salamander. Some may be black or brown, others bright red, orange or yellow, with an infinite variety of markings and patterns. To the herpetologist these salamanders are more confusing than the fall warblers are to the ornithologist. Also, an interesting example of mimicry is seen in this salamander, as some individuals in and around the Great Smoky Mountains have bright orange or red-cheek patches very much like those of the red-cheeked plethodons of the same range. This phenomenon occurs only where the two ranges come close together or overlap and is not seen elsewhere. Scientists are not certain as to the significance of this apparent case of mimicry and further research is needed to establish whether it imparts a definite survival benefit.

Concealing coloration undoubtedly plays a part in the protection of certain salamanders from their enemies. The Green salamander (*Aneides aeneus*) is a cliff dweller, living in moist crevices of Appalachian lichen-covered cliffs, the green blotches on its back blending perfectly with the lichens that grow on the rocks. These salamanders, while largely nocturnal, are sometimes abroad on damp sunless days, running about over the rock faces. Also, the Northern Shovel-nosed salamander (*Leurognathus marmoratus marmoratus*), a large aquatic salamander of swift-flowing mountain streams, is seldom seen because of its remote habitat. Mottled with shades of brown, buff, and gray, it is almost invisible as it walks about over the varicolored pebbles on the bottom.

The remote amphibian ancestors of our salamanders go back in time to the Devonian Period, some 300 million years ago, and represent a

Countless icy brooks which tumble over mossy rocks in deeply shaded mountain gorges provide homes for many salamanders. A two-lined salamander rests on a bed of ripe eggs (right, bottom), and you can even see the tiny salamanders inside these ready-to-hatch eggs (right). The Blue Ridge spring salamander (upper right) retains its gills and lives in the water in larval stage for three years, then transforms into an adult land dweller. Below is a red-backed salamander resting on a bed of moss.





Some saw-toothed peaks in the Southern Appalachians (far left) are home to isolated races of salamanders which are found nowhere else on earth. The Mount Mitchell spring salamander (below) is one such species, and is found on the peak of Eastern America's highest mountain. Though many salamanders are brilliantly colored, the spotted salamander (left) has a body that is almost transparent because it has just hatched from an egg. These adult red-spotted newts (lower left) are among the most common species. They can be seen in streams, bogs and puddles throughout the mountains.

crucial link in the evolution of the vertebrates. Evolving from the Crossopterygian fishes, they were the first of the earth's creatures to leave the water for a life on land, bridging the gap between fins and feet, and ultimately giving rise to the reptiles. True salamanders like the ones we know today arose in the Cretaceous Period at least 100 million years ago and represent a modern remnant of the ancient amphibians.

While many species still cling to the ancient hereditary pattern of returning to the water for breeding and egg laying, others like the woodland salamanders of the genus *Plethodon* deposit their eggs on land in cavities of rotting logs with complete larval development taking place within the egg, the young hatchlings having the appearance of tiny miniature adults.

Although the vast majority of American salamanders mate and lay their eggs in spring and summer, a few wait until late in the year. The Marbled salamander *(Ambystoma opacum)* lays her eggs in mid-autumn when goldenrod is blooming along fencerows and the swallows are departing on their long journeys south. The eggs are laid in a low depression always near, but never directly in the water, the female remaining curled around them until the rains of autumn come, filling the depression and causing the eggs to hatch. The young larvae then wriggle into the permanent body of water, where they remain until their transformation into land-dwelling salamanders.

Closely related to the Marbled salamander is the large, handsome Spotted salamander (*Ambystoma maculatum*), slate black with a row of vivid yellow spots down each side, and reaching a length of seven inches. While some observers in the Great Smoky Mountains National Park have reported finding Spotted salamander eggs in February, the breeding season occurs over most of the southern Appalachians some time during the month of March.

Near my home in the Carolina Blue Ridge Mountains is a chain of woodland ponds to which great numbers of these salamanders migrate every spring for a ritual of mating and egg laying. They reach these ponds from about March 20th to March 25th, or a little later if the weather remains cold.

During the winter months they remain in deep underground retreats, largely in a state of inactivity. But eventually the colder weeks pass and winter slips toward spring. Sap starts its upward flow to swelling buds and pussy willows lift their gold-furred blossoms to the March wind. Then on a certain night, almost always with a warm rain falling, the Spotted salamanders are quickened into a flurry of activity, as large numbers emerge from their burrows almost simultaneously for the annual trek to the vernal breeding ponds. The ponds may be a quarter mile away and on the other side of a hill; but with an almost uncanny sense of direction, they move on with no hesitation, no lingering, no waste of time until they reach them.

When they reach the ponds, individuals of both sexes drop in the water and engage in a nuptial courtship dance, a milling mass of black and yellow salamanders swimming and revolving around each other in a kind of aquatic ballet, making the water boil and bubble in their excitement.

Soon after fertilization is completed, the egg laying begins, with the females depositing large globular masses of gelatinous-coated eggs, averaging about 125 eggs per cluster. Each individual egg is a transparent spherical globe that, as the days go by, shows the little occupant curled up inside like a quarter moon, its branching gills becoming clearly visible as hatching time draws near.

With the breeding cycle over, all the adult salamanders leave the ponds and return to the hills and woods from whence they came. The show has ended. The curtain has fallen. But hundreds of egg clusters attached to sticks and plant stems throughout the ponds foretell that there will be a new generation of Spotted salamanders to carry the torch when spring returns again to the highlands of North Carolina.

Harry Ellis is a professional nature writer and photographer who has published photographs and articles in many magazines, including NATIONAL WILDLIFE, AUDUBON and NATIONAL GEOGRAPHIC. Ellis lives in Bakersville, North Carolina.

Nature's Soaring Predators

George Roe captures the awesome power and grace of these magnificent aerial hunters.

We hardly notice most birds as they flit through our subconscious, but that's never true of a hawk. The sight of one of these magnificent aerial hunters always brings at least a small shiver of excitement. Driving along the highway, you may see one sitting in haughty splendor in the very top of a dead tree. Or maybe you'll see another skimming over a field, quartering it systematically while searching for any sign of movement.

Englishman George Roe is fascinated by hawks, and he has captured four of our most common species here in all their grace and awesome power.

Almost from the beginning, Englishman George Roe seemed destined to become a wildlife artist, and his series of fine paintings of hawks which appear here represent the degree to which destiny has prevailed.

The combination of a mother's love of art, a boy's love of wildlife, and the influence of 17th century artists all played a key part in Roe's development. Although Roe did not come from a family of artists — his father was a motor engineer — his mother was raised on the estate of a nobleman where she was surrounded by very fine art works. Roe's mother received instruction in art during her childhood schooling while her father served the nobleman as a private secretary (and interestingly enough, became England's leading authority on horse racing).

George Roe

Although Roe's father wanted him to become a draftsman, his mother encouraged him to pursue an art career. He honed his talents under a scholarship at the Cambridge School of Art, and later at the St. Albans School of Art, and finally at the Hornsey School of Art.

Roe spent 12 years teaching art after graduation, painting portraits as a sideline. The demand for his portraits grew until 1970, and he gave up teaching to devote all of his time to painting.

Word of his expertise as a portrait painter spread until he was eventually commissioned to paint some of England's most noted citizens, including comedian Eric Morecambe.

Success freed Roe to pursue his first love in painting; and he held several highly successful one-man wildlife shows at David McDonald Booth's gallery in the Knightsbridge section of London.

Roe traces his love of wildlife to his childhood when he lived in the country near Newcastle. He had a boyhood friend whose father was the caretaker of a large estate, and George had permission to roam the estate, sketching the birds and animals.

As an amateur naturalist, he combined an acute eye for nature with an almost photographic memory to bring wildlife to the canvas with a finite detail. His research includes many days spent in the woods with his binoculars, as well as trips to the zoos or museums and study of his own collections of eggs, skulls and feathers. Roe prefers to be known as a naturalist who uses art as a medium in which to record the facts of his research.

The George Roe "style" of painting involves using a technique he adopted from one used during the 17th century. After making a sketch of his subject on the canvas in grey-brown tempera — a water-based paint containing egg yolks — he paints in oil over the original sketch. He uses solid oil paint for the highlights and semi-transparent paint in the shadows, letting the underpainting show through.

George, his wife Ann, and children Vivian and David have returned to England after a year's stay in Fuquay-Varina, North Carolina, but his reputation as a naturalist-painter has grown here in the states as well as in England.

He and his family plan to return to the United States in the future so he can continue to paint the wildlife of America.

By Larry Lane

The Red-Shouldered Hawk

Seldom is the red-shouldered hawk seen very far from some sort of water . . . a stream, marshy pond or swamp. A secluded woodland with water nearby is ideal habitat for this large hawk which prefers a diet of frogs, crayfish and snakes when these are available. It is still an effective controller of rats and mice, however, and like all other hawks, is an asset to mankind. The red-shouldered hawk and its relatives steadily declined in numbers until the last year or two; now many reports seem to indicate that these birds may be making a slight comeback. Aside from the thoughtless gunner, hawks have few natural enemies.

The Sharp-Shinned Hawk

"Little Blue Darter" is one of the sharp-shinned hawk's nicknames, and it is certainly a quick, darting bird. Small birds make up a large part of its diet, but mice and large insects are also on the menu. Its habits, coloration and general characteristics are very similar to those of the Cooper's hawk and it takes an expert to visually tell the two apart. It apparently is a shy and secretive bird, preferring to keep under cover in thickets and brushy field borders, darting out to snatch its prey. It isn't abundant anywhere in the State, but is more frequently seen in the western half of North Carolina. The winter population is considerably higher than that of the summertime. Even though it and all its hawk relatives are protected by law from shooting and trapping, many fall victim to irresponsible gunners.

The Coopers Hawk

If any hawk even partially lives up to its reputation for chicken thievery and game bird killing, the Cooper's hawk probably comes the closest. It is a small, swift hawk with powerful wings and strong talons. Its flight through fairly dense thickets is amazing, and its twisting, turning pursuit of songbirds seldom ends in failure. Like the rest of the hawk clan, the Cooper's is an opportunist, and it certainly will bear down on a chicken when the occasion arises. This hawk is found over all of North Carolina, but is nowhere abundant. It is more frequently seen during the fall and winter, but is easily confused with the sharp-shinned hawk, particularly in flight. The sharp-shinned is a bit smaller and has a square tail; the tail of the Cooper's hawk is rounded. The nest of the Coopers is smaller than that of most hawks and less than 50 feet from the ground.

The Red-Tailed Hawk

When we think of hawks, the red-tailed hawk certainly is one of the first to come to mind. It is a large, powerful hawk, highlighted by its tail which is a soft reddish chestnut on top and white below. It is the largest hawk that we generally see in North Carolina. It is found scattered over the entire State at all seasons, although it may be more common in autumn and winter. Its favorite perch is a tall, dead tree overlooking a field edge where mice and other small prey are likely to be. Although the hunter might object to one of the redtail's diet items, the gray squirrel, the hawk more than makes up for this occasional act by destroying many, many rats, mice and grasshoppers that plague the farmer. The redtail's nest is a bulky structure of sticks, lined with finer materials, and built in the crotch of some large tree, 40 to 60 feet above the ground. A well-constructed nest may be used by the same pair for several years. Nesting usually takes place in late March.

Ken Taylor

When Shad Fill The Rivers

A decade ago, hardly anyone in North Carolina knew that shad were super sportfish, but that's all changed now.

By Jim Dean

George Washington knew about shad. On April 11, 1760, he wrote in his diary that "about 11 o'clock, the people set to hauling the seine, and in the night, they catched and dressed barrels of herring and 60 white fish."

Those white fish were shad, and Washington and many other river landowners and planters of that era traditionally took advantage of the spring runs to net the spawning herring and shad, selling what they could not use. Until very recently, shad fishing was entirely a commercial venture with nets. Indeed, most of the commercial fishermen had no idea that shad could be caught on hook and line; nor did they care.

One can only imagine what Washington's reaction would be if he happened to take a stroll along the banks of the Susquehanna River in Maryland during the peak of the

sport fishing run today. He would surely think the world had gone mad.

Stretched out before him would be a panorama of incredible confusion. Standing hip-deep in the water about 10 yards from the shore would be a solid line of fishermen standing haunch to paunch — all casting and reeling furiously. Just behind them would be a second line of fishermen waiting impatiently for someone in the front ranks to leave (or possibly drown). Occasionally, someone in the second line would fire a cast either over the heads or between two of the front line anglers.

On the muddy bank, hundreds of other fishermen and onlookers would be milling around. Some would be cleaning fish, while others would be visiting the many portable snack stands which sell hot dogs, coffee and birch beer. If you watched the whole scene for a few moments, you might see a sudden leaping flash of silver out in the river past the tangled lines. That meant someone in the pack had hooked another shad.

As commercial species, shad have been popular since the earliest days of this nation, but their renaissance as sport fish occurred late. Although a handful of anglers in the late 1800's knew that shad and herring would strike small flies in the rivers of the northeast, few actively sought them. Early in this century, fishermen along the Connecticut River learned that shad would take hooks garnished with beads or red flannel, and some fish were even caught on various types of bait. About 1930, small bait-casting jigs and spoons were being used to catch shad in the Susquehanna River, and this practice spread to the northeast and to the rivers of upper Virginia. Shad fishing became popular in Florida in the St. Johns River, and even spread to California in the late 1950's (shad were first introduced into West Coast Rivers in 1871).

It was at least 1965 before more than a handful of North Carolinians knew that shad could be caught on hook and line in this State. Until then, a few knowledgeable fishermen took shad in the Tar River behind Bob Melton's Barbeque in Rocky Mount, and a few shad were also caught below Lock No. 1 on the Cape Fear River, but that was about it.

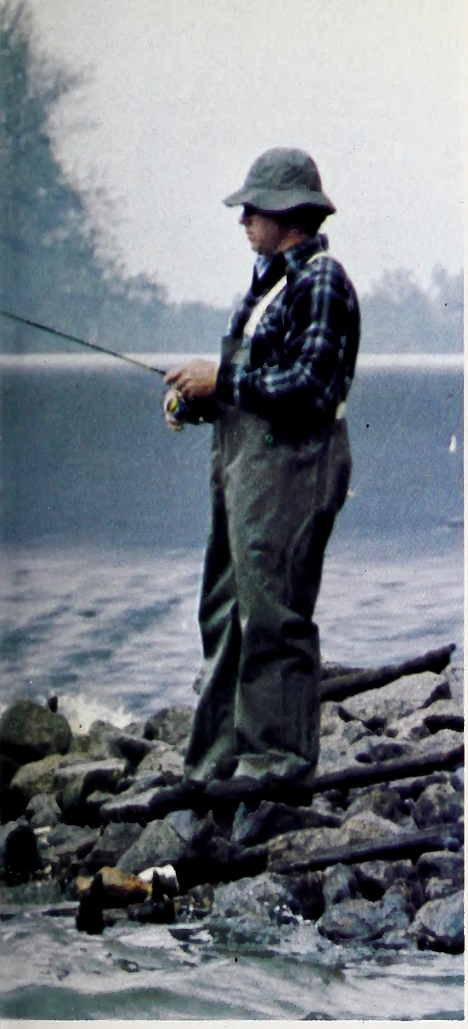
The shad revolution in North Carolina can be traced at least partly to a cooperative agreement between fisheries biologists of the N.C. Wildlife Resources Commission and the U.S. Army Corps of Engineers. Biologists knew that the Cape Fear River had once been a prime shad river each spring, but the construction of three navigation locks had effectively sealed off the run for more than 50 years. Even so, shad still gathered at the base of Lock No. 1 each spring, although they were unable to proceed farther upstream.

In 1962, the Commission worked out a cooperative agreement with the Corps that is probably unique in the annals of fishery management. Biologists felt that if the three locks — Lock No. 1 above Wilmington, Lock No. 2 at Elizabethtown, and Lock No. 3 below Fayetteville — could be opened partially, there would be enough flow to attract shad into the locks. Then, once the shad were in the lock, the upper gate could be opened and the fish would move upstream.

The idea of "locking" fish through the system was ingenious and it worked. In 1963, only 12 shad were caught upstream of the first lock; but by 1965, catches of shad were being made at all three locks.

Anglers fish for shad in the turbulence below the low dam at Lock No. 1 on the Cape Fear River early in the morning (left). While many fishermen use boats below the locks to fish for American shad, those who cast from the banks catch their share of fish as evidenced by the nice one flopping in this angler's landing net (below). Small jigs called shad darts (lower left) are a favorite lure.

Ken Taylor



Ken Taylor

Now, more than a dozen years later, the Cape Fear shad run is an annual event that attracts many sport fishermen.

During that same period, anglers began to gather in increasing numbers on the Tar River at Rocky Mount, and others began to seek out other rivers throughout the Coastal Plain. Almost overnight, sport fishing for shad became a favorite spring sport attracting increasing numbers of fishermen.

In North Carolina, as in most coastal states, there are two species of shad. The hickory shad is the smaller of the two species, averaging about a pound and a half and rarely reaching more than two pounds. The American or white shad grows much larger, averaging perhaps three pounds and occasionally reaching weights in excess of 10 pounds. North Carolina's state record American shad was caught in the Tar River by R.S. Proctor several years ago. It weighed seven pounds, 15 and a half ounces.

Both species are edible, and the roe is highly prized, but the American shad has by far the best tasting flesh. In many coastal rivers, both the hickory and American shad are found during the spring — along with countless herring which also ascend the rivers to spawn. Herring will also occasionally strike artificial lures, and these small cousins of the shad are considered such delicacies that some river restaurants open only for the month or two during the peak of the runs to serve crisply fried herring, roe and cole slaw.

Shad and herring are anadromous and spend most of their life at sea. Each spring — usually beginning in March — they enter our coastal rivers and begin to run upstream to their spawning grounds. The herring usually appear first, followed by the hickory shad and finally the American shad. In rivers which have all three species, the runs often overlap. Curiously, some rivers are noted primarily for their hickory shad runs, while others feature the larger American shad almost exclusively. The

best hickory shad runs probably occur in Contentnea, Pitchkettle and Grindle creeks near the town of Grifton north of Kinston. Indeed, Grifton hosts a big gala shad festival each year. Both hickories and American shad are found in the Neuse, Chowan and Pamlico rivers.

Other good shad rivers include the Trent, Black, Whiteoak, Tar and Northeast Cape Fear rivers (not to be confused with the Cape Fear previously mentioned).

In years past, I have enjoyed some spectacular fishing at several of these spots. Once, I landed over 30 hickories in about two hours while fishing at the mouth of Pitchkettle Creek and had similar success at Contentnea Creek that same spring. I've also had excellent luck with the larger American shad just below the low dams at the locks on the Cape Fear. (Don't get too near those low dams. Many people have drowned in the backwash).

During the past five or six years, the shad runs have sometimes been sporadic. Some put the blame on unpredictable spring weather and water conditions that are unfavorable. Others have been quick to blame the massive trawling operations — especially by the Russians — off our coast. Still others say channelization has reduced flooding in the lowlands around the various creeks and rivers where shad spawn. Shad — especially hickories — need some flooding to achieve ideal spawning conditions.

Some believe that pesticides have adversely affected the runs; and of course, there is always the chance that the decline is merely a natural fluctuation.

Actually, any or all of these factors could be playing a role, but no one is quite certain why the shad runs have slackened in recent years. Still, with the relatively new 200-mile fishing limit now in force off our coast; and with any sort of favorable weather, this spring could see a return to the heavier runs of our recent past.

Fishermen who have never landed a shad on light tackle owe it to themselves to give these fish a try. Shad have been called the "poor man's tarpon," and not without reason. Few fish will put up more fight on light tackle.

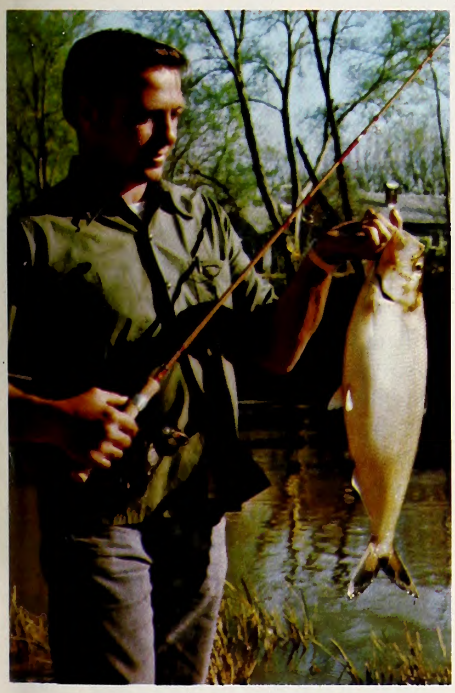
A hickory shad may spend almost as much time in the air as he does in the water — three to six jumps per fish is not unusual. The larger American shad jump less frequently, but they more than offset this shortcoming by making long, powerful runs. In swift water, a big shad can rip off 25 to 50 yards of line. Neither species ever seems to tire. Eventually, you will simply decide to land your fish, but it's not because he's turned belly up and quit on you.

You'll have your best luck if you follow a few tips in choosing your tackle. An ultralight spinning rod with four-pound test monofilament is by far the best outfit for the smaller hickories, and you can certainly handle the larger American shad on such rigs, but it will take more time. Most fishermen use light to standard action spinning rods for American shad, and either six or eight pound test monofilament. In either case, choose a reel that has a smooth drag.

Small lead-head jigs known as shad darts are very popular, and these are generally available throughout the eastern part of the State. Small spoons — both gold and silver — also catch a lot of shad, and

The Tar River at Rocky Mount behind Bob Melton's Barbeque (below) is a favorite shad fishing spot, and the banks are often lined with fishermen. R.S. Proctor (right) is proud of this fat American shad which he took on a shad dart. Proctor's fish weighed seven pounds, 15 and a half ounces, and is the current state record. There never seems to be a good time to try to net a shad. Shad just never quit fighting, but these two anglers (far right) are tensely waiting for the moment of truth.

Jim Dean



the No. 1 Reflecto Spoon is one of the favorites.

Strangely enough, shad can be quite selective. On one day, they may prefer darts, while on another day, they may favor spoons. Also, preferences seem to vary widely from one river to the next; so it pays to have a fair selection of both darts and spoons in several sizes, weights and colors. (You'll lose a lot of them to snags anyway). White darts with red heads and yellow bucktails are favorites, but other colors sometimes work better.

Many fishermen use a single dart tied onto the line, or they may rig a dart or spoon behind a trolling lead to give them more casting weight.

I like to rig either two darts or a dart and a spoon in tandem. If you rig two darts of varying weights, let the lighter dart trail the heavy one by about 12 to 18 inches. This will help you avoid tangles when casting. Also, if you use a dart and a spoon, let the spoon trail the dart.

Your fishing technique will depend upon conditions, but generally, shad like to stay in the current. If you are on the bank, cast across and slightly upstream and let your lure or lures sweep downstream while you retrieve very slowly and steadily. You need not twitch your lure to entice a strike. The trick is to get your lure deep enough so that it is traveling just off the bottom. Naturally, you'll lose a lot of lures to hang-ups.

The same general technique applies if you're fishing from a boat; however, be sure to fish the lure all the way to the boat. Shad will sometimes follow a lure and strike just as you're lifting it out of the water. Indeed, some successful fishermen merely let their darts or spoons trail in the flowing water behind the boat. It's like trolling while sitting still, and it often works.

Since shad move upstream in schools, your fishing is often of the feast or famine variety. If you time your trip at the peak of the run and you know that shad have been caught regularly in preceding days, stick with it even if your luck is poor. A school could pass through at any time.

In some instances, the time of day seems to make a difference. I like early morning and late evening, but I'll admit I've caught plenty of fish at mid-day. An overcast day seems to be an especially good time to fish.

Without a doubt, the biggest factor in your success will be determining when the peak of the shad run will occur, and then making sure you're there. Unless you've got a contact along the river, that can be tough. One thing is certain, however. Sometime during the last two weeks of March or the first two weeks of April, the hickory and American shad are going to be in many of our rivers; and if you're on hand to welcome them, you'll never forget it.

Gilbert Pearson

Early Protector Of Wildlife

North Carolina's wildlife owes a big debt to this almost forgotten man who founded this State's Audubon Society and pioneered modern wildlife protection over 75 years ago.

By Mark Taylor

N.C. State Archive

The gunner crouched behind the rocks as he knotted the white handkerchief around the end of a short stick. He loaded his shotgun and threw the stick high in the air. A tern circling the rookery saw the flash of fluttering white, wheeled over to investigate, and was downed by the shotgun's blast. One by one, the adult birds flew over to circle their fallen comrades, and the hunter methodically shot them down until he had killed the flock. The Tar Heel terns were gracing ladies' hats in fashionable New York City nightspots a few months later.

From dawn till dusk, the thunder of punt guns shattered the autumn night far up in the protected bays and backwaters of Currituck Sound. Over 400 men earned their living market hunting at Currituck, and schooners loaded with waterfowl sailed through Back Bay to Norfolk where the birds were shipped to markets and restaurants in Baltimore, Philadelphia, New York and other northern cities.

Farther inland, on humid summer nights that lay over the Piedmont and Coastal Plain like a wet blanket, men would gather around the outskirts of town at dusk. As the nighthawks hunted insects in the dark sky, the men banged away at the elusive targets. Dead birds were left on the ground to rot, and cripples often didn't rate the extra shot needed to finish them off.

North Carolina was a wide-open place at the dawn of the 20th Century. There were a few laws on the books protecting wildlife, but they were rarely enforced. Game and fish were God-given gifts; and as the Bible said, "Man shall have dominion over all the creatures of the earth." Man was exercising that dominion with a vengeance, and the wildlife was rapidly disappearing.

It took a poor former market hunter from Florida to bring the State to its senses.

Thomas Gilbert Pearson, a biology professor, was the first man to achieve any significant success working for wildlife protection in North Carolina. Pearson had firsthand knowledge of the destruction wrought by market hunting and plume hunting. He was the son of a poor Florida farmer; and as a youth, had hunted egrets for their plumes and collected eggs for his collection and for sale to other amateur naturalists. His skills as a hunter, taxidermist and egg collector brought him to North Carolina.

When he was 18, he applied to dozens of colleges throughout the country hoping to get a scholarship in exchange for work. Guilford College, a Quaker School near Greensboro, was the only college to offer him a scholarship. In exchange for running the school's museum of natural history, Pearson got free tuition, room and board. Later he accepted a position as biology professor at the State Normal and Industrial School in Greensboro.

Pearson took his first step towards protecting North Carolina's wildlife in 1902. George Bird Grinnell, the

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Gilbert Pearson (left and below) was the first man to achieve significant success developing an effective program of wildlife protection for North Carolina. He also led the fight to ban market and plume hunting which furnished feathers widely used in women's hats.

founder and publisher of *Forest and Stream* magazine, had founded an organization dedicated to protecting nongame birds. He called it the Audubon Society in memory of the great ornithologist.

Pearson founded a chapter of the Audubon Society in Greensboro in 1902, and some of his strongest supporters were wealthy bird hunters. Pearson had two immediate goals in mind for North Carolina — to end plume hunting and market hunting for waterfowl. He had his work cut out for him.

In 1903, the State took its first positive step towards wildlife conservation when the legislature passed the "Audubon law." This law gave the Audubon Society the power to enforce wildlife laws in North Carolina and authorized the Society to hire game wardens to carry out the enforcement. These efforts were funded by individual donations and through the sale of a non-resident hunting license for $10. Surprisingly, the non-resident license bill was unpopular with Tar Heel citizens even though most non-resident sportsmen were wealthy waterfowl hunters. Folks felt that a non-resident license was in direct contradiction to the time-honored tradition of Southern hospitality!

Pearson was the perfect man to lead the Audubon Society. He stumped the State preaching wildlife conservation with evangelical zeal and was a familiar figure in most rural newspaper offices. Country editors supported his cause, and he was equally effective buttonholing legislators in Raleigh. As chapters of the Audubon Society sprang up across the State, an overwhelming army of school children, women's organizations, and sportsmen demanded laws protecting nongame birds and native game species. Legislators listened, and statewide laws protecting North Carolina's wildlife started appearing on the books.

While Pearson stumped the State, 50 Audubon Society game wardens were prowling its woodlands. These men received the princely sum of $2.50 per day if they were on special duty, or fifty bucks a month if they were full-timers. Folks became upset when these hard working men began confiscating shipments of quail bound for expensive Baltimore restaurants at railheads. The poachers soon tried a different tack, and started stuffing quail in the body cavities of dressed chickens and turkeys.

The Audubon wardens weren't picky about who they arrested and often paid the price for it. The men became national heroes in 1905 when Guy Bradley, an Audubon warden in Florida, was murdered while attempting to arrest a gang of plume hunters single-handedly. Three years later, James Evans, the Audubon warden for Currituck County, took a load of bird shot in his chest and face while he chased a market hunter. Evans stayed on his feet long enough to identify the man who'd bushwacked him, but the man was acquitted in court. Market hunters had little to fear from the courts of many coastal counties. At a time and place where cash was hard to find, the profits from shooting waterfowl were tempting. Records indicate that the combined income of gunners in Currituck County averaged over $100,000 per year for their kill during the first ten years of the 20th Century. One report states that two commercial hunters in Currituck once shot over 200 redhead ducks in one trip and received $140 for their day's work. Market hunting for waterfowl didn't end until the Federal Migratory Bird Act was passed in 1918.

While some Audubon wardens were busy prowling the marshes of Currituck County, others were busy farther down the coast protecting seabird colonies from feather and plume hunters. The Society had a 38-foot motorboat — built for the grand sum of $800 — to patrol the small spoil islands in the sounds that the birds used as breeding sites. While Audubon wardens protected the birds on their nesting sites, Pearson was fighting for them in the legislative halls of Washington. His goal was to put an end to plume hunting by making it illegal to use

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feathers and plumes of wild birds in any type of clothing.

Pearson had a particularly tough time with the millinery industry because of the millions of dollars being made on articles of clothing which featured plumes. The industries' lobby insisted that the demand for ladies' hats would vanish if bird feathers couldn't be used in them. Pearson, however, was an effective and persuasive fighter. Faced with a crowd of hostile, fashionably dressed women, Pearson picked out handsomely feathered hats worn by various women in the audience. He then described how each species of bird represented had been slaughtered on its breeding grounds. He soon won over his audience.

Pearson spent a lot of time traveling in other states helping to set up new chapters of the Audubon Society and testifying before legislators on wildlife protection bills. He had a nasty surprise waiting for him when he returned to Raleigh in the summer of 1911, after making a trip to Mexico to help the Mexican government set up a wildlife department.

The Audubon wardens had stepped on too many toes. Legislators claimed the Audubon Society was growing wealthy off license fees and fines (it wasn't) and that the Society was spending taxpayer's money (they weren't) on wildlife protection. Local laws seemed in order, and a bill was passed allowing counties to exempt themselves from the Audubon law.

Before laws were passed through the efforts of men like Gilbert Pearson, market hunting and plume hunting were big businesses in North Carolina and elsewhere in the country.

By the end of 1911, only 46 of the State's 100 counties remained under the Audubon Society's jurisdiction. In these counties, game wardens were appointed by local politicians, and wildlife protection was once more nonexistent. The Audubon Society threw in the towel and suggested to the legislature that a State Game Commission be formed since they no longer had the authority to enforce wildlife laws. It was almost 20 years before their suggestion was adopted, although they introduced the bill at every legislative session.

Eventually, in 1927, a State Division of Game and Inland Fisheries was created as part of the N.C. Department of Conservation and Development. Unfortunately, the newly created division was short-handed and still plagued by politics, conflicting local laws and political maneuvering.

It was not until 1947 that the N.C. Wildlife Federation (a close-knit organization of sportsmen's clubs) along with independent sportsmen and other conservation agencies successfully fought for an independent wildlife agency run by a professionally trained staff.

That new, independent agency is the present N.C. Wildlife Resources Commission, and it has been nationally recognized as one of the most effective wildlife agencies in the country (although problems with local laws which take precedence over statewide laws continue to be a problem).

In Pearson's day, however, the breakup of the Audubon Society's jurisdiction in 1911 proved to be very discouraging to those who had fought so long for proper wildlife management and protection in the State.

For Pearson, the best option seemed to be to widen horizons, and he was soon fighting for wildlife protection on a national and international scale. When William Dutcher, president of the National Association of Audubon Societies, was stricken with a paralysing disease in 1910, Pearson had begun serving as secretary of the organization, a title which he retained until 1920, when Dutcher passed away. It was characteristic of Pearson's generosity to be content with the title of secretary even though he was running the organization.

In 1920, Pearson officially became the president of the National Audubon Society. For the next 20 years, he traveled the nation fighting for the Audubon cause. New chapters were formed, legislative bills were passed protecting our wildlife, refuges were created, and one of Pearson's pet projects — an extensive education program for school children — was created. Pearson well remembered how badly he had wanted to learn about nature when he was young, and was determined that no child would be barred from this knowledge for lack of money or opportunity.

Pearson finally retired from his post in December of 1942, after spending 42 years of his life fighting for wildlife at every opportunity and on every front. He wanted to relax and planned to do some writing, but his retirement was brief. He passed away in September, 1943. Because of his efforts, we now have laws protecting songbirds, waterfowl and other forms of wildlife. Audubon refuges are scattered across the country. The organization that he devoted his life to has become a national spokesman for the environmental causes and is carrying Pearson's banner for a better world.

Letters

Dear Sir:

What a thrill my family and I received on Sunday, January 28, 1979, at my parents home. While enjoying a nice visit and chat we observed approximately six or eight bluebirds feeding in their backyard. I say approximately, because we were so excited that it was difficult to count. I do know that there were quite a few, both male and female. My husband said he had not seen as many bluebirds in some years.

My parents live in a residential area and there are no bluebird houses around that we know of; however, they have a large holly tree which is abundant with berries, so we observed the birds eating their pretty little hearts out. I told my father that we were going to erect a house so that maybe the birds would nest.

I hope that this is a good sign and that the bluebirds are on a comeback. We receive the WILDLIFE IN NORTH CAROLINA magazine and are very pleased with the new format. Keep up the good work.

Mary Barrett
Fayetteville

It's a bit late (by the time you read this) to put up bluebird houses, but it may be worth a try. For a simple bluebird house plan, write: Division of Information and Education, Wildlife Commission, 512 North Salisbury St., Raleigh, N.C. 27611.

Dear Sir:

Last year, some time in the spring, I missed the meetings that were held to talk about the hunting regulations which would be set for the following year. If possible, I'd like to know when these will be held this year so that I and some other club members can go and give our views.

Jimmy C. Morisey
Asheville

See page 24 for hearing schedule.

Dear Sir:

I was under the impression that North Carolina had a year-round open season on (mountain) trout, and then I heard some fishermen say they were "going to open the season" on March 31. What's the story on the trout season?

Sam Mason
Winston-Salem

The North Carolina trout season runs from January 1 through February 28, is closed from March 1 through March 30 and reopens March 31, running through December 31. The exceptions to this are "trophy waters" and power supply lakes which are open year-round. It would be best to get a copy of the current Inland Fishing Regulations from your nearest hunting and fishing license agent and carefully go over the section on mountain trout.

Dear Sir:

The February WILDLIFE was really good, and as I read it I felt I was there; the photography was good and the staff that put it together is to be complimented. "Back of the Book" edited by Mark Taylor was particularly interesting.

North Carolina has a beautiful coastline; how about writing some articles (along with photos) on some of your shrimp boats and your old lighthouses? One to mention is the Baldhead Island lighthouse.

Richard Sourkasian
Surfside SC

We always appreciate kind words, and believe it or not, we're seriously considering a photo feature on North Carolina's lighthouses. If we can get it together, we'll run it next year.

Dear Sir:

I am 16 years old and have been a hunter and fisherman for two or three years. I would like to take some courses in high school that will help me find a job in wildlife management. Do you have or know of any booklets or pamphlets that would be helpful in telling me about jobs with wildlife?

Mike G. Little
Charlotte

A helpful little booklet entitled, "Careers in Conservation," is available (single copies are free) from: Conservation Department, Winchester-Western Division, Olin Corporation, East Alton, Illinois 62024. Two other interesting companion booklets (also free for single copies) are "For The Young Hunter," and "Principles of Game Management."

Dear Sir:

It has been several years since I've lived in North Carolina, but I still have many fond memories of the Tar Heel State. I am very much interested in knowing if you have wildlife prints or lithographs available. These would permit me to "see" the wildlife of North Carolina on a daily basis.

Kenneth R. Mooney
Tampa, Florida

The Wildlife Resources Commission has available the following wildlife prints: a set of six, 11 x 14 inch fish prints (largemouth bass, bluegill, brook trout, rainbow trout, crappie and smallmouth bass) for $10, or $2.00 each; three, 16 x 20 inch limited edition prints under the Carolina Conservationist program, one of red-cockaded woodpeckers, one of the brown pelican, and one of a group of wildlife species either extinct, or recently returned to North Carolina. These are all high-quality lithographs, signed by the artist and numbered for $25 each, or signed only for $10. Write: Prints, Wildlife Resources Commission, 512 N. Salisbury St., Archdale Bldg., Raleigh, N.C. 27611.

Dear Sir:

I have just read the February issue of WILDLIFE IN NORTH CAROLINA and want to commend you and your fine staff for the excellent work on the article about the N.C. Zoological Park.

Since the Zoo is planning to open its first natural habitat exhibit this summer, the article is certainly timely.

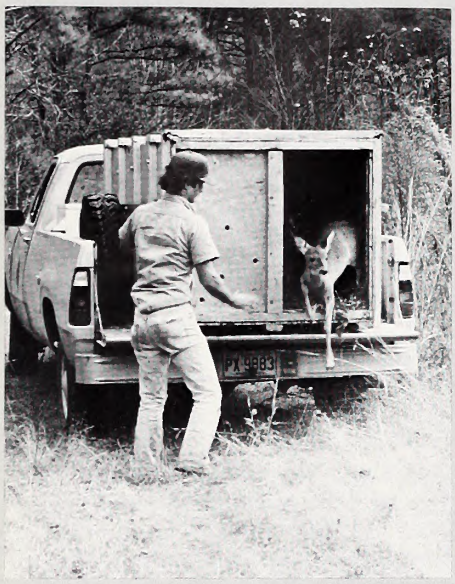
I offer my special thanks to Jim Dean, David Williams, Ken Taylor and author, Rick Estes, for their efforts and cooperation with the Zoo personnel in putting the story together.

Robert L. Fry, Director
N.C. Zoological Park

We have received many favorable comments on the Zoo article and a couple pointing out the fact that we didn't acknowledge the individual gifts of animals by groups and organizations throughout North Carolina. These donations are very much appreciated by the Zoo, and we're sorry that we didn't have room to mention them in the article.

Restoration Program Bringing State's Deer Population Back

Deer Restoration "A Tremendous Success"



This deer was stocked in Johnston County last November.

Biologists report that the N.C. Wildlife Resources Commission's deer restoration program is going well. During 1978, the restoration of the upper French Broad section of the Pisgah Game Lands was completed with a total of 52 deer stocked. The Brush Creek-Yellow Mountain area restoration in Macon and Jackson counties was also finished, with 50 deer being stocked.

Work is still under way on the Elk Knob restoration area in Watauga and Ashe counties. Forty deer were stocked there in 1978, and plans call for 20 more deer to be stocked there in 1979. The little River area in Johnston County was stocked with about 25 deer last November.

"Our deer restoration program has been a tremendous success," said George Smith, assistant chief of the Commission's Division of Game. "When deer were at their low point in the State during the 1930's, there were only a few thousand animals left. Now, we estimate that there are probably 400,000 to 500,000 deer statewide."

The first serious attempts at restoring deer populations in North Carolina were made on the Biltmore Estate near Asheville in the 1890's. Deer populations in the Mountains and in the rest of the State had been decimated due to habitat destruction, overhunting, and commercial hunting. Only a few deer remained in the impenetrable swamps down east, and some of these were trapped and released alive on the Biltmore Estate. Those deer that were stocked on the Biltmore Estate form the nucleus of the deer herd in the Mountains today. Many of the deer used by the Commission in its current restoration program are still captured on the Biltmore Estate. Deer used for stocking are captured in a cannon net baited with apples, then the animals are loaded in trailers and hauled to their new homes.

"Without our stocking program, we wouldn't have the deer populations we see today," said Smith. "The deer population in the early 1950's, when we started the program, was very low. Populations in the Piedmont and Mountains were especially low. Since 1968, we have trapped and stocked about 720 deer in all of our restoration areas."

Although trapping and stocking deer is very expensive, it is also very effective. If the habitat in an area offers what the animals need for food and cover — they will rapidly increase their population. The two biggest problems in deer restoration are illegal hunting and predation by free-roaming dogs, so protection and public cooperation are essential to the program's success.

According to Charlie Woodhouse, a Commission wildlife biologist, the Hackney Restoration Area on the Neuse River in Johnston County is a good example of a successful stocking program. Between 1969 and 1974, 109 deer were stocked in that area. Biologists now estimate that the deer population in that area has grown to over 2,000 animals.

Keep Rover At Home

If you want to do wildlife a favor, keep your dog tied up for the next couple of months.

"Dogs prey on the young of turkeys and many other wildlife species," said Wayne Bailey, head of the Commission's wild turkey program. "Turkeys are especially vulnerable from late April through early July when they can't yet fly. All of the young of wildlife species are especially vulnerable at this time of year."

According to Bailey, the problem with free-roaming dogs is especially acute in the Piedmont and in parts of the Coastal Plain. These dogs aren't necessarily wild; most are household pets that are allowed to run free. But almost any dog will kill wildlife.

"Dogs differ from natural predators in several ways," said Bailey. "For starters, most of them are being fed at home; so they aren't dependent upon wildlife for their primary food. If they were natural predators, there would be nowhere near as many of them in the woods as we have today. They also aren't native to North America, and wildlife species haven't gone through the evolutionary processes which would adjust their behavior to compensate for dog predation. Also, dogs will hunt both day and night, while natural predators usually only hunt at one time or the other."

Weekend Focus On Wild Foods

April 27-29 are the dates for this year's Wild Foods Weekend to be held in Rockingham County. During the two and half-day program, participants go out and collect wild vegetables under the direction of an experienced "forager," learn to identify and cook the wild edibles, and generally have a fine time in the outdoors.

For information and registration material, contact Wild Foods Weekend Committee, c/o Bill Noonan, 412 Rosewood Drive, Lexington, NC 27292, before April 9.

"Water Isn't Clean Anymore" In Three Tar Heel Rivers

Three North Carolina rivers have been named as problem areas in a recent survey done by the Tennessee Valley Authority. The survey is titled, "Where The Water Isn't Clean Anymore."

The Pigeon River near Canton, North Carolina, was named a critical problem area by TVA. During dry weather, the entire flow of the river is often used by a pulp and paper mill. Although the waste water from the mill is treated, it is not diluted when water levels are low and problems with water color and low dissolved oxygen downstream from the mill result. Dissolved oxygen is an essential component for a healthy fish population in a river. TVA recommends more extensive treatment of waste water from the mill.

The North Toe and Nolichucky rivers were also named as critical problem areas by the TVA. The tailings from mining operations are washing into the North Toe River, and are adversely affecting a 20-mile stretch of the river near Spruce Pine. The suspended solids from the tailing piles have also washed down into the Nolichucky River and reservoir from the North Toe; and in 1970, 77 percent of the storage capacity of the reservoir had been lost due to sedimentation. Although waste water from the mining operations is treated, TVA recommends going to a maximum pounds per day discharge of sedimentation into the river instead of the current discharge limit based on concentrations of suspended solids in the effluent. TVA also recommends that vegetative cover be established on tailing piles, that storm runoff from the tailings be controlled, and that removal of existing sedimentation in the river's channels be investigated.

Hominy Creek, which flows into the French Broad River near Asheville, was also named as a major problem area. The problems in Hominy Creek arise from industrial and municipal wastes. The industrial waste comes from a textile mill, which releases treated waste water into the creek. Raw sewage from homes in the area is also being released into the creek, although plans are under way to connect the homes with the Asheville sewage treatment plant. TVA believes that current cleanup efforts at the site are inadequate to solve the problems.

TVA named a total of 17 critical problem areas and 28 major problem areas in its survey which covered the entire Tennessee Valley Drainage area. Included in the areas were the states of North Carolina, Georgia, Alabama, Mississippi, Tennessee, Kentucky and Virginia. In two of the rivers named in the survey, fish contained enough pollutants to make them unsafe to eat. The two rivers are the Holton River in Virginia where mercury contents in fish flesh have exceeded the FDA's guidelines by 10 times, and in an embayment of the Tennessee River near Huntsville, Alabama, where DDT levels in fish have exceeded the FDA's maximum limit by 40 times.

Copies of "Where The Water Isn't Clean Anymore" are available from the Tennessee Valley Authority, Information Office, 400 Commercial Avenue, Knoxville, Tennessee 37902.

Lespedeza Plantings Aid Wildlife

Farmers who wish to improve wildlife habitat and control erosion can kill two birds with one stone by planting shrub lespedeza, according to Sheridan Dronen, a plant materials specialist for the Soil Conservation Service in Raleigh.

Shrub lespedeza is not only excellent wildlife food, but the plant has a very strong root system and is ideal for controlling erosion along field borders where it acts as a "filter strip." The plant also provides ideal cover for many types of small game, especially quail, and is beneficial to many nongame species.

Shrub lespedeza seed may be obtained through N.C. Wildlife Resources Commission game biologists or through your local S.C.S. office.

Environmental Program Slated

The National Audubon Society has established a special environmental education program which can serve as an accredited portion of any college, high school or graduate student's curriculum. The program covers such diverse topics as Everglades and Okefenokee ecology, Williamsburg-Sturbridge living history, Southwest desert life systems, Arizona Indian site excavations, Maine coast tidepool ecology and other topics. Programs vary in length and are run year-round.

For more information contact the Audubon Expedition Institute, 950 Third Avenue, New York, NY 10022.

November Enforcement Report

For the month of November, 1978, the N.C. Wildlife Resources Commission checked a total of 25,401 hunters and fishermen and 344 boaters.

Of the hunters and fishermen, 756 were prosecuted and 666 convictions were obtained. The total fines collected were $7,272 and the total costs collected were $14,976.

Of the boaters, 225 prosecutions were made and 196 convictions were obtained. Total fines collected were $811 and total costs collected were $4,835.

Other prosecutions totaled 45 and convictions totaled 45. Total fines collected were $697 and total costs collected were $585.

All fines and any arrest or witness fees were paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected were paid to the N.C. Wildlife Resources Commission or its personnel.

Santeetlah Fish Ladder Built

Old fish barrier no longer obstacle to spawning trout

A fish ladder has been installed over the fish barrier at the mouth of Big Santeetlah Creek which will allow the brown, rainbow and steelhead trout to pass over the barrier on their journey to the spawning grounds upstream. In the past, the fish have congregated at the base of the barrier where they found their spawning runs abruptly blocked.

The Santeetlah fish barrier was built during the early 1960's to prevent rough fish from entering the creek from Santeetlah Lake. Although the barrier did prevent carp, suckers and other undesirable species from entering the creek, it also stopped the spawning runs of trout as well. It didn't take long for biologists to notice a drop in the lake's trout population.

The new fish ladder will allow trout and steelhead to pass over the barrier but will still not allow rough fish to enter the creek. The fish ladder was built by members of the Young Adult Conservation Corps (YACC) under the supervision of U.S. Forest Service personnel.

Since 1975, biologists have stocked approximately 6,000 young steelhead trout in the Santeetlah and Snowbird tributaries to Santeetlah Lake. Biologists are trying to determine when the steelhead spawning runs occur on Santeetlah Creek, and anyone noticing steelhead congregating at the barrier or passing over the fish ladder should contact the N.C. Wildlife Resources Commission or the U.S. Forest Service in Robbinsville.

Fisheries biologists recently installed this new fish ladder on Santeetlah Creek. The old fish barrier was designed to prevent rough fish from entering the creek and competing with trout.

Regulation Hearings Set

The public hearings to discuss proposed changes in the 1979-80 hunting and trapping regulations are to be held as follows:

April 2, 1979	Edenton	Courthouse	7:30 p.m.
April 3, 1979	New Bern	Courthouse	7:30 p.m.
April 4, 1979	Nashville	Courthouse	7:30 p.m.
April 5, 1979	Elizabethtown	Elizabethtown Jr. High School	7:30 p.m.
April 6, 1979	Graham	Courthouse	7:30 p.m.
April 10, 1979	Sylva	Jackson County Community Center	7:30 p.m.
April 11, 1979	Morganton	Morganton Jr. High School	7:30 p.m.
April 12, 1979	Yadkinville	Courthouse	7:30 p.m.
April 13, 1979	Albemarle	Central Elementary School	7:30 p.m.

Directory To Old Time Seeds Available

Gardeners and horticulturists looking for sources of old seed varieties are in luck. The Graham Center, a non-profit demonstration farm and training center, recently published the *Graham Center Seed Directory: A Gardener's and Farmer's Guide to Sources of Traditional, Old-Timey Vegetable, Fruit and Nut Varieties.*

The cost of the directory is $1 per copy, and it tells where many hard-to-find traditional seed varieties can be found. Many old varieties have been lost because, in the past, no one bothered to raise them and keep the seed. The directory also lists organizations that are dedicated to preserving these species.

The directory is available from the Graham Center, Route 3, Box 95-F, Wadesboro, NC 28170.

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written by Duane Raver/photograph by Jim Dean

The Mystery Of Mushrooms

Where do mushrooms leave off and toadstools begin? Which are the "good ones" and which are the "bad?" Few of Nature's common items leave so many partially answered questions and conjur up so much mystery as do the mushrooms. We probably should not even use the term "toadstools," which really means different things to different people, since they're all mushrooms anyway.

Their variety is almost endless, presenting the would-be mushroom gourmet who insists on gathering his own with serious problems since some can cause death or serious illness when eaten even in tiny amounts. Although the writers of many mushroom "handbooks" indicate that the edible and harmless mushrooms have reasonably apparent characteristics which separate them from the deadly kinds, sound judgement says don't eat them unless their identity is absolute and beyond a shadow of any doubt. The "poisonous" label is further confused since some varieties react violently on some folks, and only mildly, if at all, on others. Taking any chance, however, simply isn't worth the risk. If you are determined to eat wild mushrooms, one of the easiest to identify, and one of the best eating is the morel.

The morel is perhaps the most easily recognizable edible mushroom. While not common in the State, it is sometimes found in early spring (occasionally in late autumn) in old apple orchards or burnt-over, wooded ground at cooler elevations.

Mushrooms, poisonous or otherwise, are fungi and fungi are plants. But they are plants without that food-building green material called chlorophyll. And in several other aspects, mushrooms don't conform to the ways of their green plant cousins. Almost all fleshy mushrooms are "saprophyts," meaning they grow on dead and rotting plant material . . . old stumps, logs, the forest floor debris. Even those that pop up over night in our front yards are living off of some sort of decaying vegetable matter.

There are many intriguing and almost mystifying aspects in the world of mushrooms. The "fairy-ring" growth pattern for example, excites the imagination even after years of study and scientific explanation. Not all mushrooms have this habit of "growing in circles," but once you've seen these rings from a foot or two in diameter to some circles ten or more feet across, you'll certainly remember it. A fairy-ring is actually a grass disease, starting at a point of origin where some spores (the dust-like microscopic reproductive bodies of the mushroom) landed on a suitable spot. From this spot, the root hairs (mycellium) and spores have spread in everwidening circles, as long as they found continuing food sources in the area. The rings are far from perfect circles, but they are fairly symetrical.

The values of mushrooms go beyond the tasty qualities of both the wild and commercial varieties. Fungi also provide a means of breaking down all the dead vegetation, wood and so on, that otherwise might not enter the recycle of life. Also, many wild mushrooms serve quite a number of wildlife species as important food. Deer, squirrels, even raccoons and others eat the here-today, gone-tomorrow mushrooms. Insects and turtles also quickly dispose of many of these fungi. It's difficult to know just how important a wildlife food source mushrooms are since the existence of some varieties is so short.

Temperature and moisture certainly are important factors in muchroom growth, and some may require very exact degrees of each for development. For example, a few days of wet weather in the spring and summer bring out the mushrooms in a matter of hours. Late summer and fall is perhaps the high point of the mushroom season: bright reds, sulfur yellows, brilliant oranges and varying shades of silver gray, dot the forest floor from late August on into November.

The fascinating world of the mushroom will soon come to life; watch for it.

LITHO BY HUNTER PUBLISHING CO., WINSTON-SALEM, N.C.

The high, misty stillness of our Southern Appalachians is home to more different species of salamanders than anywhere else in the world, and many are as colorful as this red salamander seen hiding under damp lichens and mosses.

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WILDLIFE IN NORTH CAROLINA

MAY 1979

CAROLINA
RALEIGH

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MAY 2 1979

Our Natural Heritage

by Jim Dean

The Kudzu Invasion

There is a theory that the world will ultimately be ruled by cockroaches and kudzu. That's funny only to those who have never had to deal with either, and there are undoubtedly folks in the South who believe kudzu will outlast roaches.

Kudzu, in case you don't know, is a leguminous vine which was first introduced into the United States from Japan in 1876 at the Philadelphia Centennial Exposition.

Since that time, kudzu has become entangled in the culture of the South. Indeed, our stereotyped image as the land of magnolias and moonpies has almost been smothered in kudzu vines.

Kudzu is no mere vine, of course, unless you consider King Kong a mere ape. Its growth is explosive. There are claims that kudzu can shoot up as much as 12 inches in 24 hours. Tendrils can reach 60 feet in a season, often climbing vertical obstacles as high as 40 feet. Because the vine has such deep tap roots and is so leafy, it is virtually indestructible and soon engulfs acres and acres of land. It can blanket junked cars, abandoned houses, fences, trees and even telephone poles.

So thick is kudzu by late summer that it is impassable; and although the leaves fall after a killing frost, the vines return with renewed vigor each spring.

An estimated million acres of land have been "eaten" by kudzu, with most of the damage confined (at least for the moment) to the South. Kudzu is a problem from Maryland, Virginia and central Kentucky south and west into east Texas and Oklahoma.

Perhaps the most amazing thing about kudzu is that it was once considered a miracle vine — a long-sought answer to erosion, an enricher of worn-out soils, and a cheap forage for livestock. Experiments by the U.S. Soil Conservation Service in Georgia showed that land planted with kudzu had nearly 80 percent less water runoff and more than 99 percent less soil loss than land under cotton. This sort of information led to an almost evangelical campaign to save the South through kudzu.

Federal agencies, including SCS, promoted kudzu actively and millions of seedlings were given away. The Civilian Conservation Corps planted kudzu to help curb erosion, and initial success was so dramatic that communities formed "kudzu clubs" and elected "kudzu queens."

Up until about the time of World War II, kudzu continued to grow in popularity; but by 1950, it was wrong.

Kudzu proved to be only fair forage, partly because it was easily overgrazed and much of it was woody stem and useless as hay. Certainly it was an effective soil stabilizer and erosion control, but it removed the land from any other use as effectively as asphalt paving.

The real problem, however, was that kudzu simply didn't stop growing. More than one farmer half-kiddingly joked that he had been forced to "run for his life" after planting kudzu.

"If'n you got a neighbor you don't like and you want to cause him a heap of trouble, just sneak over and plant some kudzu in his yard one night," one old-timer was quoted as saying. "Come morning, his house will be so wrapped up in kudzu that he'll think he's in a jungle. There ain't enough hoes chopping full-time in North Carolina to keep an acre of kudzu under control."

By the mid-1950s, the love affair with kudzu was over. The U.S. Department of Agriculture removed the plant from the list of permissible cover crops in 1953, although SCS continued to recommend kudzu for limited uses. Finally, in 1970, the U.S. Department of Agriculture threw in the towel and listed kudzu as a common weed.

Perhaps the strangest thing about the kudzu story is not the transformation from "miracle vine" into obnoxious pest; it's the length of time it took. During the 1930s and 1940s, kudzu was king, but nearly 20 years elapsed after the problems were truly understood before kudzu received official condemnation. Today, the kudzu story is still a source of embarrassment to those who so stoutly supported it years ago.

The point of this is not to rub salt in old wounds. It's simply that we need to be reminded of such ecological blunders as the great kudzu hustle because history has an unfortunate way of repeating itself from time to time.

WILDLIFE IN NORTH CAROLINA

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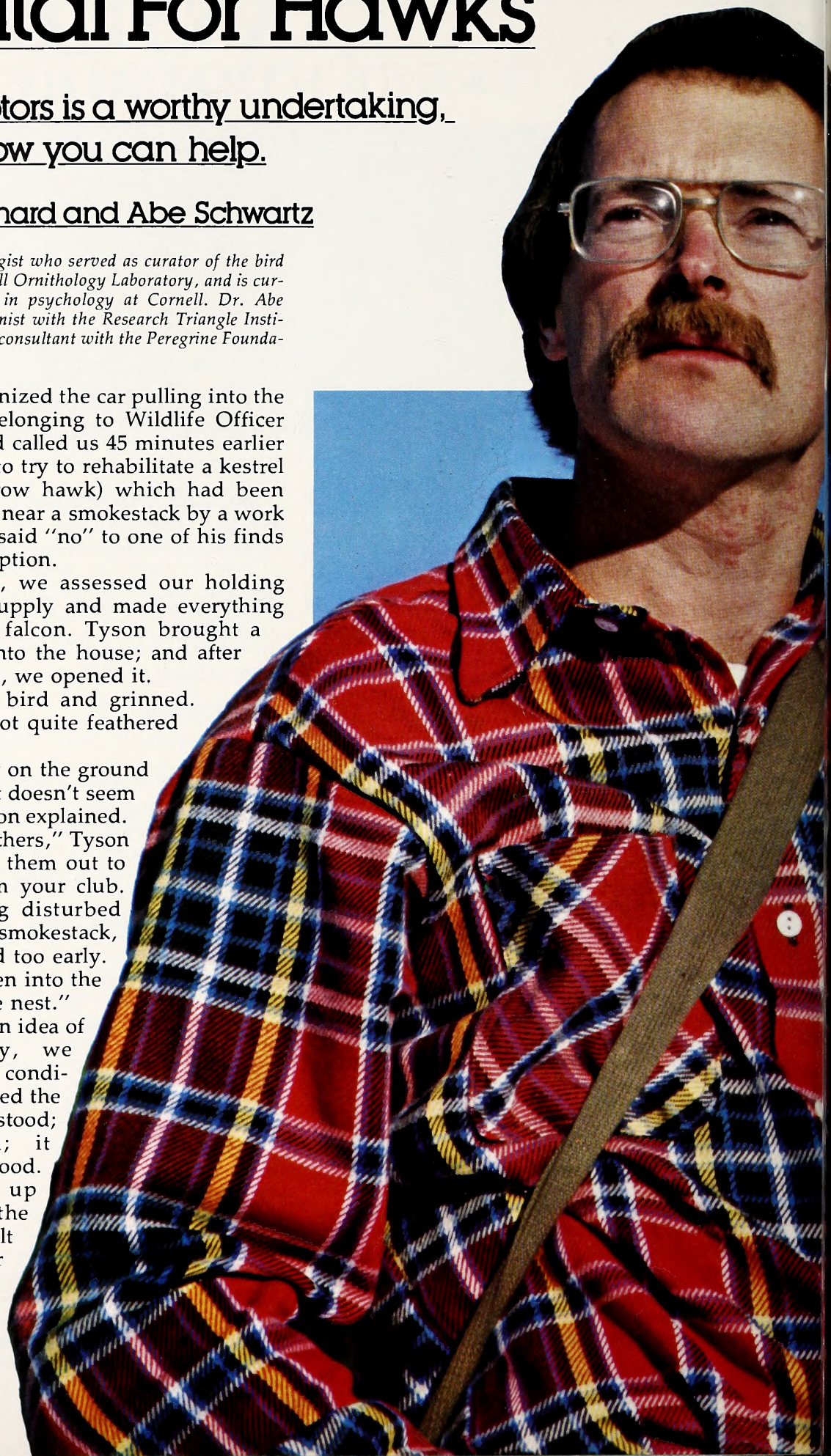
Hospital For Hawks

Repair of raptors is a worthy undertaking, and here's how you can help.

By Ginny Engelhard and Abe Schwartz

Ginny Engelhard is a zoologist who served as curator of the bird song collection at the Cornell Ornithology Laboratory, and is currently a graduate student in psychology at Cornell. Dr. Abe Schwartz is a physical chemist with the Research Triangle Institute and served as scientific consultant with the Peregrine Foundation at Cornell University.



We quickly recognized the car pulling into the driveway as belonging to Wildlife Officer Tyson Laney. He had called us 45 minutes earlier to ask if we wanted to try to rehabilitate a kestrel (often called a sparrow hawk) which had been found on the ground near a smokestack by a work crew. We had never said "no" to one of his finds and this was no exception.

After hanging up, we assessed our holding facilities and food supply and made everything ready for the small falcon. Tyson brought a medium-sized box into the house; and after exchanging greetings, we opened it.

We looked at the bird and grinned. "It's a male kestrel not quite feathered out enough to fly."

"The crew found it on the ground covered with gunk. It doesn't seem to be able to fly," Tyson explained.

"There were two others," Tyson explained. "I farmed them out to Mike and Larry from your club. Evidently something disturbed the nest. It was on a smokestack, and the birds fledged too early. They must have gotten into the goo after they left the nest."

Now that we had an idea of the bird's history, we needed to assess its condition. We carefully lifted the bird out of its box. It stood; it turned around; it walked. So far, so good. Next we picked it up carefully, avoiding the sharp talons, and felt the breast muscles for signs of starvation, and the wings for breaks.

"This will be

easy," we agreed. "He's just out of the nest a little early, and he's hungry. We'll put him on a perch in the small mews and he'll be on his way in a week."

While in our care, "Smokestack" as he came to be called, practiced catching grasshoppers and other bugs on the mews' floor. It was two weeks before he finally left us, taking off over the house after a flock of swallows. Smokestack's rehabilitation was a fairly typical one. Raptors which are otherwise known as birds of prey, may get into trouble in many ways. They may fly into fences or windows while chasing prey and break a wing or receive a concussion. They may be unable to fly because they are weak from hunger as a result of bad hunting weather or poor hunting skills. They sometimes fledge too soon and cannot fly back to the nest. And, occasionally they are the victims of a shooting. It should be noted that raptors are migratory birds and are protected under the Federal Migratory Bird Act which prohibits them from being shot or trapped.

photography by Ken Taylor

Successful rehabilitation of raptors requires experience, medical help, proper holding facilities, and appropriate food. The initial examination and assessment of the bird's problem is crucial, for it is here that the decision to get medical help is made. Fortunately, our club, the North Carolina Hawking Club, is in contact with roughly half a dozen veterinarians with the specific expertise and interest to help rehabilitate raptors.

At the veterinarian's office, an injured bird will receive a more thorough examination and the appropriate medical treatment. In some cases where the damage and suffering are excessive, euthanasia is judged the best solution. Fortunately, however, a large percentage of the injured birds can be successfully treated so that they can ultimately be released back into the wild.

The major factor in raptor rehabilitation is time. If the bird can be kept in a safe, quiet place and given the proper food for a long enough period, it has its best chance. However, providing the food and shelter for these birds of prey is seldom easy.

Birds of prey require meat, and not just any meat will do. After all, how often have we seen a hawk chasing a "hot dog" for its prey? The best food for raptors is, of course, their natural food: mice, squirrels, rabbits, and small birds. It is neither easy nor cheap to provide these foods year-round. Nonetheless, a diet of mice, road-killed rabbits and squirrels, and store-bought chicken will sustain these birds while in captivity. It is important that they receive the entire animal, rather than just the muscle meat. Not only do the fur, feathers and bones provide the required minerals and vitamins, but they also form the pellet which is regurgitated as part of the natural process of cleaning the stomach.

Proper shelter may be even more difficult and expensive to provide. Initially, an injured bird is kept indoors in a dark, quiet box. The bird not only has an injury problem, but is frightened of people. Certain species, such as the sharp-shinned hawk, may become so panic stric-

ken at being handled by humans that it will have a massive stroke and die.

When the bird's condition is stable, it is placed in a large separate room or building, called a mews. In here, it may have some freedom to exercise its wings. The mews must be away from the distractions and traffic of dogs, cats, and children. In emergencies, our bathroom has satisfied these requirements over the years, although there have been drawbacks to this practice when guests visit.

Many times the birds have feather damage which can be repaired by replacing, or "imping in," a new piece of feather. It is, of course, desirable for the replacement feather to be from the same species, age, and sex as the injured bird, especially if it is hoped that it will enter into the breeding population the year it is released. Imping is done by fashioning and gluing a bamboo splinter into the two halves of the feathers to be joined.

The average raptor is kept from two to six weeks before release. Most of the time, releasing a bird back into the wild is not a problem, especially if it is an adult and has had at least one year of hunting experience. However, if the bird is immature, special efforts must be made to ensure that it can fly and hunt for itself. This situation requires what is called "hacking back." One way is to feed the bird in the same place for a week or so before it is released. After release, food is supplied at that place for an additional week in case the bird has poor luck hunting and returns to the area.

A young barn owl we named "What" provided us with great amusement during his rehabilitation and ultimate hacking back. He was too young to fly when he was delivered to us, and he seemed a perfect candidate for residency in the bathroom. He had his own ideas about the matter and holed up in the cabinet under the sink. One night, after his feathers had grown and he seemed to be flapping well, we opened the window to let him go. He was gone by morning. Three days later, after giving up on his return, there was a loud thud at the bathroom window. "What" was back and trying to get in. We opened the window, and he took a perch on the shower curtain rod where we fed him three mice.

For a month thereafter between nine o'clock and two o'clock in the evening, "What" would return through the bathroom window to be fed, but he would always disappear by morning. Ultimately, feeding him directly became a nuisance so we left the mice on the sill of the open window. One night he stopped coming. Perhaps he tried a different house and got into trouble, or perhaps he became a successful hunter. We hope it's the latter, and

our bathroom window will be open in the spring just in case we are lucky enough to have a guest drop in.

Injured young birds present an even more difficult problem for release since their inexperience is coupled with a performance handicap. These birds need to be exercised and given practice catching things. "Reggie," an immature red-tailed hawk with a broken wing, was just such a bird. For several weeks before Reggie's release, she was allowed to fly after and catch dead mice tied on a string which we would drag along the ground. It worked fine, and we were able to release Reggie with reasonable hope that she would survive.

If you should happen upon a raptor in trouble, it's a good idea to contact your local wildlife officer or the North Carolina Wildlife Commission (call toll-free 800-662-7137). They can direct you to people like us who have the necessary facilities, experience and permits for raptor rehabilitation.

However, until help arrives there are some things you can do. Without disturbing the bird too much, try to determine the problem. Handle the bird as little as possible, remembering that these birds are hunters and that it is no fun being grabbed by needle-sharp talons or bitten by a powerful, hooked beak.

Keep the bird in a cool, dark place away from the family traffic. A pasteboard box with a good top and lined with newspaper will serve the purpose. Above all, do not place the bird in a chicken wire cage. Severe damage to the eyes, feathers and feet from the thin wire may easily occur in such a cage. Since it is likely that the bird has not eaten in several days, try to offer it some food. Chicken liver or breast meat dipped in egg yolk is an excellent choice at this time. Never feed raptors cooked or spiced meat, such as a hot dog, or fatty meat like bacon.

Hawks and owls are an important part of our wildlife ecology; and under normal circumstances, they are well adapted for survival. With a little help from their friends, even those which become injured can be nursed back to health.

The North Carolina Hawking Club is working in conjunction with the North Carolina Wildlife Resources Commission in a raptor rehabilitation program. If you wish to have more information about these activities, write:

North Carolina Hawking Club
P.O. Box 12621
Research Triangle Park, N.C. 27709

written and photographed by Doug Elliott

THEY CALL IT GREEN GOLD

Ginseng is mysterious, possibly rare, and may even have miraculous powers of rejuvenation. Above all, it is extremely valuable.

Ginseng! Come fall of the year, there are hundreds of folks out in the hills searching for it. They're looking not only in the heavily forested mountains of North Carolina, but also in other states and in Canada, China, Korea and the Soviet Union as well. They call it green gold, and it is one of the world's rarest and most valuable plants. It can be worth a hundred dollars a pound or more.

In North America, ginseng has been found from Canada to Georgia. Most of the lush mountainous regions in the western part of North Carolina, and a few areas in the Piedmont, are ideal ginseng habitats. It is usually found in rich, shady hardwood coves.

The ginseng plant itself is not nearly as flamboyant as its price and reputation would have you believe. It is an inconspicuous plant, rarely exceeding two feet in height. It has a perennial, slow-growing rootstock that produces a new top each year. Two to five prongs or leafstems radiate from a central stalk. Each leafstem ends in a palmate cluster of usually five leaflets. Arising from the center of the whorl of leaves is a cluster of five to twenty tiny greenish-yellow flowers blossoming in May or June, followed by a clump of two or three-seeded berries that turn a bright shining red between August and October.

However, it is valued not for its crimson berries or five-fingered leaves but for its strange, tuberous root. This root is white, fleshy, and is usually branched in one or more places. On rare occasions the root may be branched in such a way that it takes a human shape. When this occurs, the root is said to be worth immense sums of money. In fact the name "ginseng" is derived from Chinese and means "man-shaped."

A recent purchase of ginseng is spread on a newspaper on W.B. Hughes' desk in his shop in Asheville (left). Because of the seasonal nature of the ginseng business, Hughes deals in several dozen other roots and herbs, as well as raw furs and cobbler's supplies. Scales for weighing herbs and roots appear in the foreground. Bottles of ginseng tonic reflect the light from a nearby window in the home of a root collector (above). Some people believe ginseng has miraculous powers of rejuvenation.

Theron Edwards of Yancey County (far right) admires a particularly large three-pronged ginseng plant which he found. Edwards is a plant expert and knows most of the plants he finds in the woods. Ginseng is only one of the many roots and herbs he gathers. Ginseng hunters often use a stick to help them dig roots (right), and they generally concentrate their searches in rich, deeply shaded coves.

Orientals are the world's principal connoisseurs and consumers of ginseng. For more than three thousand years, the Chinese have used ginseng as a rejuvenating tonic with almost magical healing properties. From this longstanding reputation as a kind of panacea comes its bontanical name *Panax*. There are essentially two species of commercial ginseng: *Panax ginseng* which grows in the Orient, and *Panax quinquefolium*, (five-leaved) which is our American ginseng.

Although ginseng is the most highly regarded medicinal herb in the Far East, the western medical world has only recently given it a glimmer of recognition. Scientists in Europe, and to some extent in the United States, have recently been doing research and experimentation on the effects of the plant. Some of their first tentative conclusions are that ginseng seems to have anti-stress, anti-fatigue and anti-infective properties. There is also evidence that ginseng is beneficial and stimulating to the endocrine glands which are the principal regulators of the hormone flow. It is probably this property that gives it the highly publicized and exaggerated reputation as an aphrodisiac.

Oblivious to western medicine's conservative opinion, ginseng's popularity is rapidly spreading through America. Practically every health food store in the country now sells it in one form or another. There is everything from imported whole roots to ginseng extract and instant ginseng tea — even ginseng chewing gum! Paradoxically, it is rare to find wild American ginseng for sale in these stores. Almost the entire harvest of our best quality native ginseng is exported to Hong Kong — 329,754 pounds in 1976. The Far East, in turn, ships its cheaper grades of cultivated ginseng back to us.

Before the white man reached America, virtually every Indian tribe that had access to ginseng held it in high esteem. The Cherokee name for it means "plant of life," and from what is known, it appears that ginseng was used by the Indians in many of the same ways as Oriental people use it.

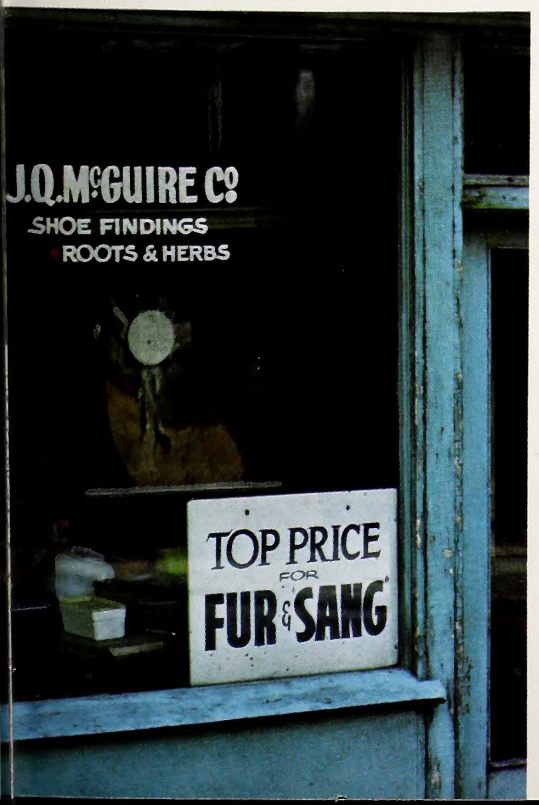
The ginseng commerce between the East and West owes its beginnings to a French Jesuit missionary, Pere Jartoux, who was traveling through Manchuria. In 1714, Father Jartoux published an article entitled, "The Description of the Tartarian Plant Ginseng." That same year, the publication reached another Jesuit, Francois Lafiteau, in Montreal, Canada. Father Lafiteau showed one of Jartoux's drawings of the plant to a group of Mohawk Indians. They immediately recognized it and took

him to a place where the root was abundant. He unearthed a few roots and sent them back to France where their identity was verified. Soon a small shipment was on its way to China to test for a potential market. In Peking, the roots were found to be of excellent quality and were sold for their weight in gold. The news of this sale spread rapidly and precipitated what has been called the Canadian Ginseng Rush of 1715. There was a great deal of frenzied trading as practically every able-bodied woodsman, trapper, and Indian scoured the forests for the newly treasured resource. The price of ginseng skyrocketed. However, by the 1750's, the ginseng was becoming so scarce that it was no longer profitable to gather and the market more or less folded.

Further south in the new colonies, however, the ginseng trade was just beginning. By 1775, one sloop had sailed from Boston to China with 110,000 pounds on board. Other ginseng-laden ships were sailing from New York to Philadelphia. Large amounts of ginseng were hauled out of Virginia and North Carolina and other parts of the southern Appalachians on the backs of mountain traders and their animals. In 1784, on a trip west to his lands on the Kanawa River in what is now West Virginia, George Washington wrote in his journal, "I meet with many mules and packs laden with ginseng going east over the Forbes-Braddock Road."

In the late 1800's, the successful cultivation of American ginseng launched a new boom. At the turn of the century, hundreds of plantations were started; but in 1904, most of them were wiped out by a leaf blight. A spray mixture containing copper sulfate and quicklime, called the Bordeaux Mixture, was finally developed as a deterrent to the leaf disease but many growers had already gone beyond the point of no return. Today, American ginseng is still cultivated primarily in the northern states and in Canada. The North Carolina Department of Agriculture, however, is trying to develop and refine culti-

Can you find the ginseng in the photo above? The diagram at right will help.



vation methods that are suitable for North Carolina.

In the years following the blight disaster of 1904, ginseng trade with the Orient steadily increased; and in recent years, has proven to be a fairly dependable business. Because of its seasonal nature, however, the ginseng merchant must deal in other materials as well. It is not unusual to see signs in front of mountain junkyards reading, "We buy scrap metal, iron, copper, radiators, batteries, wool, fur, herbs, and ginseng. Top prices paid!" Or often it is a back road general storeowner who buys ginseng. These small dealers generally sell to a large herb house like Wilcox Drug Company in Boone or Lowe Fur and Herb Company in North Wilkesboro, who in turn sell bulk quantities of ginseng directly to the exporter.

People involved in the ginseng business received quite a jolt on November 1, 1977, when the Endangered Species Scientific Authority (ESSA), a federal agency, stepped in and banned the sale of wild ginseng for export. ESSA was formed when the United States signed a 45 nation international treaty on endangered and threatened species. One provision of this treaty limited international trade of various species of flora and fauna.

This included not only ginseng but also international commerce in pelts of bobcat, lynx and river otter.

As mentioned before, since almost none of our ginseng is sold for domestic use, this action threatened a death blow to ginseng commerce in America. It also appeared likely to put an end to an important means of income for many of the country's woodsmen and mountain people. The ban was met with a great deal of apprehension, outrage and controversy. Fortunately for North Carolina's ginseng hunters, it was also met with a quick action on the part of the State Department of Agriculture. As it turned out, the ruling was not an irreversible, ironclad decision. What ESSA was saying was something like this:

"We have reason to believe that ginseng is threatened in some of its range. Uncontrolled amounts of it are leaving the country every year. If an individual state can show that it has some kind of program to monitor and manage the harvest to prevent ginseng from being extripated, we will issue that state a permit which will exempt them from the ban."

North Carolina was able to show that adequate laws protecting ginseng already existed and that ginseng was not endangered here. The State then developed a four-point program to ensure that ginseng would not become endangered here, and ESSA agreed to exempt North Carolina from the import ban.

Ginseng collection is accompanied by

This massive pile of ginseng roots represents a year's harvest of ginseng purchased by the Lowe Fur and Herb Company (top). The ginseng is packed into cardboard drums for export. Although ginseng is considered relatively rare and difficult to find, many do not believe that the plant is likely to become endangered in this State. Also, the collection and sale of ginseng is controlled by law. In the Mountains, many dealers trade in ginseng along with other commodities (left).

North Carolina's Ginseng Program

The State Department of Agriculture has developed a four-point program to ensure a stable future for ginseng in North Carolina, and the Federal Endangered Species Scientific Authority (ESSA) has approved this plan and exempted the State from the export ban.

1. Monitor the records of ginseng dealers and issue certificates to the effect that the ginseng handled by the cooperating dealers was collected from the wild in a legal manner.
2. Certify cultivated ginseng under our nursery inspection program to the effect that the ginseng roots were from nursery-grown cultivated plants.
3. Conduct an educational program to promote conservation, management, and enhancement of ginseng in North Carolina.
4. Develop a scientific monitoring program to determine the status of ginseng in North Carolina.

Clyde Hollified, who collects wild ginseng and also grows it in cultivated patches, takes a sip of his homemade ginseng tonic (right). One reason that wild ginseng seems to prosper despite its value is that plants are so difficult to spot except by experts who seem to develop a "feel" for locating them (lower right). Also, those who collect ginseng are careful to leave an adequate brood stock, and many even scatter the seeds to produce new growth.

North Carolina Ginseng Laws

North Carolina has several laws governing the collection and sale of ginseng, some of which have been on the books for over 100 years. The following laws are in effect:

1. General Statute, chapter 14, section 392, (which was passed in 1866), makes it illegal to dig ginseng roots between April 1 and September 1. The purpose of the statute is to protect ginseng during its critical propagation period.
Exceptions are:
(a) If it is grown on one's own land.
(b) If it is dug for the purpose of replanting.
Dealers should not purchase ginseng roots during the closed season unless they have evidence that the collector had dug the roots from his own property or had dug the roots between September 1 and March 31 of a digging season. Violation carries a fine of $500.00 and/or 6 months imprisonment.
2. General Statute, chapter 14, section 79, makes theft or larcency of ginseng a felony. This statute applies to roots growing in a bed surrounded by a fence.
3. General Statute, chapter 14, section 393, requires that anyone who buys ginseng in any amount must keep a register showing the amount bought, name and address of the seller, source from which obtained, amount paid, and date of purchase. Failure to keep this register or falsification of an entry is a misdemeanor, carrying $500.00 in fines and/or 6 months imprisonment for each offense.
4. General Statute, chapter 14, section 129 makes it a crime to dig, pull or take ginseng (wild or cultivated) from another person's land without having written permission from that person. The penalty is a fine of $10.00 to $50.00 for each offense.

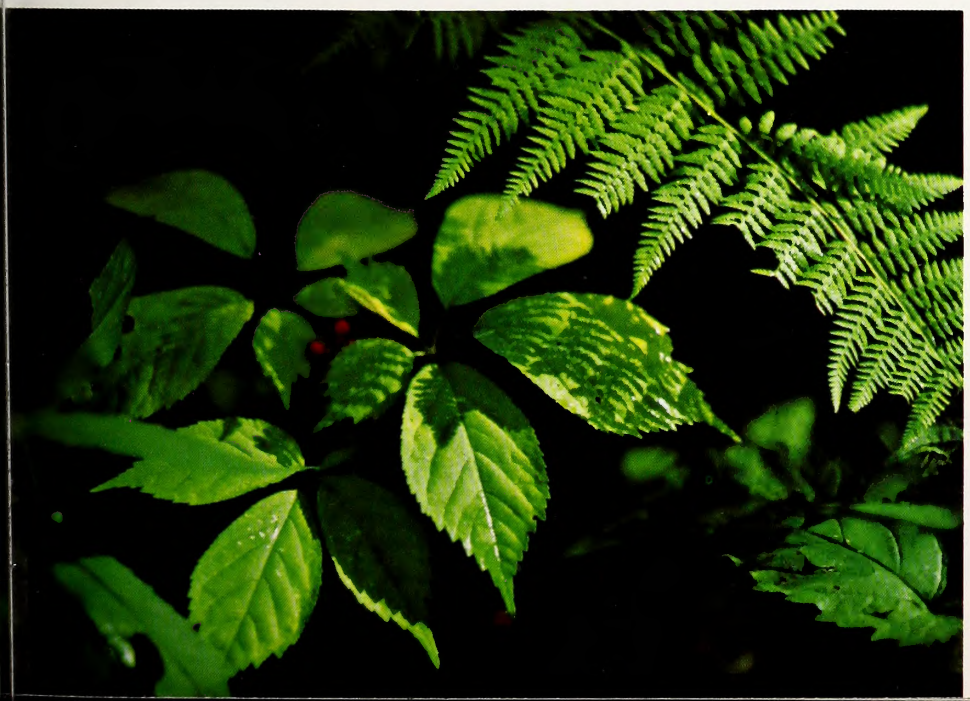
various rituals in many parts of the world where it is gathered. This is especially true in the Orient, and some of these persist today. In times past, the diggers often wore special clothing and carried traditional accessories. The unearthing of the roots was often attended by priests who determined the most astrologically propitious time. Prayers and offerings were made and a sacred staghorn was used for the actual digging.

In the Appalachian mountains, the ritual of "senging," as ginseng gathering is called, is not as formalized but is still a special autumn event for many folks. Here in North Carolina, priests are usually not consulted to determine the proper time to gather, but most ginseng diggers know enough to wait until the berries ripen in the fall. As far as astrology goes, some old-timers will tell you that the roots dry better and will weigh more if they are gathered on the "downside" or waning of the moon. Sacred staghorns are rarely used in North Carolina for digging, but the local 'seng digger does have his favorite 'senging stick. Usually it's a hardwood sapling with a chisel point on one end that doubles as a walking staff. And almost any experienced ginseng hunter will say that, when you're out in the woods and get into an area that has ginseng, you can almost "feel" its presence even if you don't see it. And sure enough, if you search in that area you will usually find it. Of course, it takes a good bit of experience and sensitivity to develop that "feel."

In the wilds, it is possible to roughly estimate the age of the ginseng by the number of leafstalks or "prongs" on a plant. The first year a seed plant germinates, it only produces three leaflets that somewhat resemble delicate strawberry leaves. As the plant gets older, it will develop a main stem with two sets of leaves (two "prongs") and perhaps have a flower stem between them. Usually by the third or fourth year, the plant develops into a three-pronged "bunch of seng" and starts producing berries. ("Bunch" is a mountain word term referring to one single plant and probably came into use because each plant is comprised of a "bunch" of prongs or leaf clusters). After six or seven years, if the plant is doing well it may develop its fourth leaf prong and is usually producing a good crop of berries each year. I have heard stories of ginseng plants with as many as eight prongs but, personally, I have never found a bunch with more than five.

Although the reports that ginseng is becoming scarce in some areas are probably valid, most experienced mountain ginseng hunters think the idea that it could be cleaned out of the mountains and made extinct is ridiculous.

It is these folks who are the most conscientious about their gathering and the most sensitive to ginseng's presence in the woods. They have been 'senging every fall for most of their lives and are able to find large amounts of ginseng in areas where professional botanists find none. I've gone 'senging with old-timers who know of patches of ginseng where they harvest roots every year and have done so for decades. They always wait till fall when the berries ripen and they only take the larger plants. They plant the berries in other likely places in the woods. Many people feel that if the seeds are scattered, they have a better chance of surviving than if left undisturbed in an obvious cluster, vulnerable to the predations of foraging birds and rodents. I have often seen the shells of devoured ginseng seeds left by rodents under a large fertile plant.



Most traditional ginseng diggers take some of the seeds and young plants home and set them out in the woods near their houses. If asked why, they will usually claim that a patch of ginseng is like money in the bank. But there is more to it than that. These folks have a lifelong fondness for the plant. For generations, it has been a source not only of medicine but also a means of trade with the world outside their often isolated communities.

Many have depended on it for their livelihood; and although few people depend on ginseng for their entire support today, there are lots of folks who would have a lean Christmas without it. Besides, as one old-timer succinctly put it, "I just like to watch 'em grow!"

Doug Elliott is a free-lance writer, photographer and artist who lives in Burnsville.

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Rumors persist that trout fishing is a harmless ritual practiced by gentlemen.

An Obsession With Trout

By Jim Dean

I happened to run across the perfect definition of a trout fisherman recently. Webster describes this particular species as one "beset by evil spirits, and thereby harassed or influenced by a fixed idea to an unreasonable degree." Getting even closer to the bone, Webster adds that the trout fisherman suffers a "persistent and inescapable preoccupation with an idea or emotion."

If you have trouble finding that definition, look up the word "obsession." It's the same.

Let's face it; everyone has one or two mild obsessions tucked away somewhere. A random list of mankind's ruling passions might include such bizarre forms as golf, sailing, fast horses, fast cars, fast women (or men) and a host of other similar attractions.

But if you think that trout fishing takes a back seat, obsession-wise, to any of the above, then you are sadly deceived.

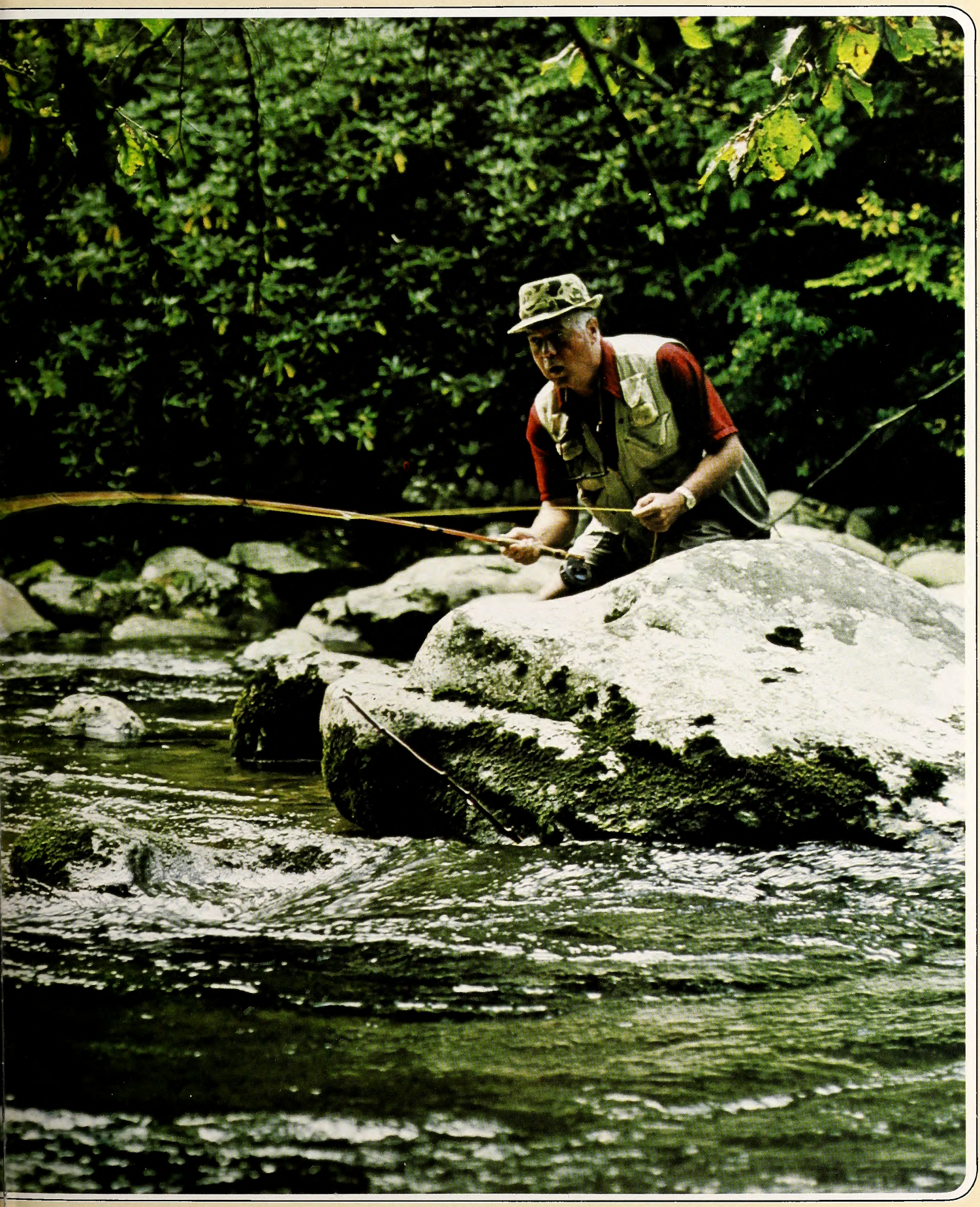
For example, I once introduced two young friends to the pleasures of fly fishing for trout. At the time, both were honor grade students at N.C. State University.

Since then, one has consistently neglected his chosen profession as a child psychologist, and has instead moved to the limestone stream region of Pennsylvania and opened a fly fishing shop. Indeed, this individual has undergone a complete personality reversal, and it is rumored that he keeps a sign on his desk which states that "Every kid in a reform school is one less kid on a trout stream."

The other student transferred to a school in western North Carolina so that he could fish every day. Not only has he abandoned a promising career in pine bark beetle biology, he has corrupted several other fellow students. It is highly doubtful if any of them will ever graduate, and they have taken a blood oath never to work on any day that the trout season is open. (They stoutly maintain that they did not know that North Carolina would open the season year-round when they made this pledge.)

And as for me? Do you think I'm ashamed that I led these rosy-cheeked children away from the straight and narrow? Hardly. I am proud to have played a small part in the enrichment of their lives. They may never amount to a hill of beans, but neither are they likely to foment any revolutions.

"The obsessed trout fisherman suffers a 'persistent and inescapable preoccupation with an idea or emotion.'"



hotography by Charley Dickey

Stealth is the secret to success on most southern trout streams. Most of our wild trout are so skittish that they'll hide under a rock and thumb their noses if they suspect you're in the same country, and catching a rainbow this size (above) is not a common event for most fishermen. Among friends, elaborate discussions of proper fly patterns is a pleasant ritual (right), and once in a great while, the angler will deceive himself into thinking that he has made a proper choice.

Even so, I can certainly see why you might believe that a trout fisherman is dangerous. Fully outfitted, he is a sight to behold. It would be far easier to equip an entire armored division than to furnish a single fly fisherman with only his most basic needs.

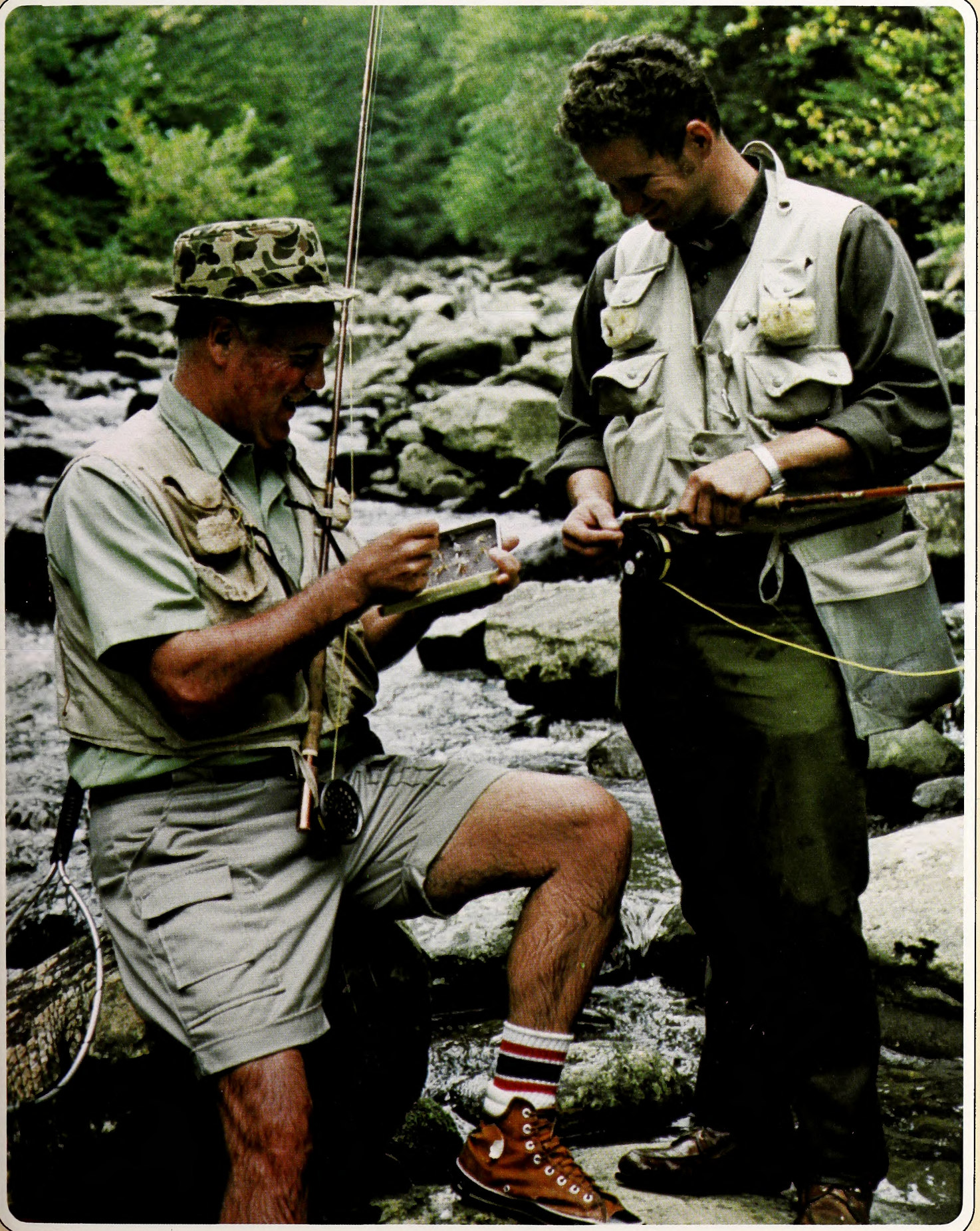
I won't even discuss proper apparel — except to point out that the trout fisherman has a fetish for rubber pants and will wear chest waders at the slightest provocation. Nor will I mention hats (there is available a four-volume publication on the subject of trout fishing hats, but I must warn you that it is out of print and first editions are bringing the princely sum of $1,200).

In the interests of brevity, we will deal only with the vest. Trout fishermen wear vests not to be fashionable, but to carry a few items of gear. A good trout vest will have no fewer than a dozen pockets and some vests have as many as 25. A famous trout fisherman by the name of Orvis J. Hacklewind is said to have invented a vest which had 148 pockets, but it was never marketed because Hacklewind drowned while testing it and his body was never recovered.

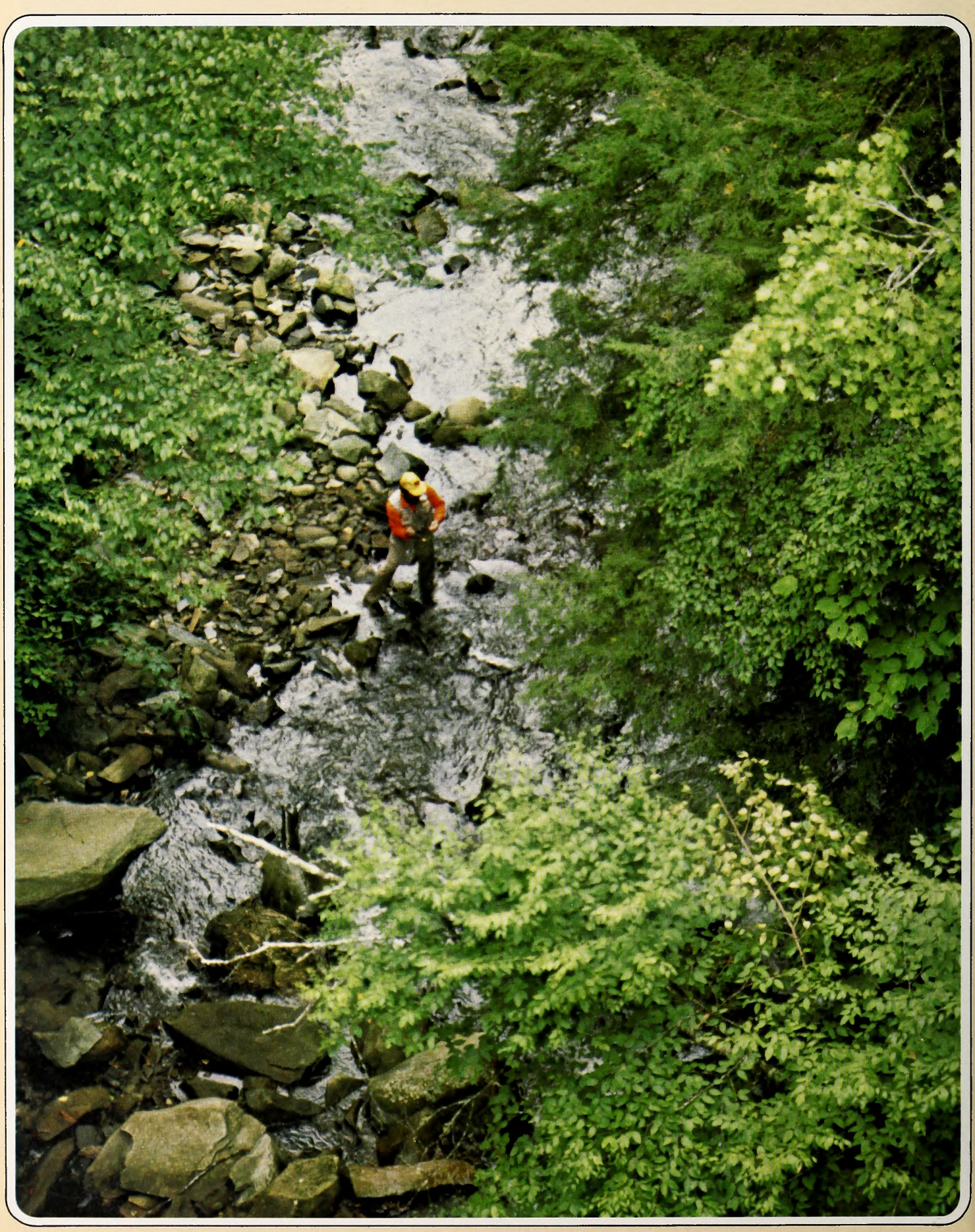
My own vest is perhaps typical. In preparation for the recently opened trout season, I undertook my annual inspection. My vest has only 24 pockets; and when loaded, it weighs a mere 58 pounds. It contains four large fly boxes and six small fly boxes with a total of 112 compartments. In these boxes are approximately 1,241 dry flies, each of which I tied to exactly match one of several thousand aquatic or terrestrial insects upon which trout have been known to feed. There are an additional four folding pouches which hold 383 nymphal patterns. I should mention that most trout fishermen find it advisable to obtain at least a master's degree in entomology.

In addition to the flies, an inspection of my vest revealed four butterscotch candies, a thermometer, a pocket flashlight, an extra reel spool, eight spools of tippet material, a knife, a police whistle, a snakebite kit, a tin of of mucilin, insect repellent, a hooded rain suit, one can of vienna sausages, four Band-aids, a tin of aspirin, a hook disgorger, two empty plastic bags, one wader repair kit, two flattened beer cans (and 42 pop tops), a packet of leaders, a tape measure, a roll of film, a dehydrated liverwurst sandwich and a large dark fuzzy lump which I have tentatively identified as a mashed oatmeal cookie covered with lint.

"The true crazies in this sport are those who tie their own trout flies."



"Of all the obsessions which plague trout fishermen, most persistent is the search for the perfect fly rod."



For what it's worth, the current practice of releasing all trout is not simply a traditional conservation measure undertaken by good sportsmen. Actually, the "no-kill" philosophy was launched in 1947 by Sir Fenwick Doublehaul after he happened to find the year-old remains of a trout in the rear pocket of his vest. He joined with other fishermen who had experienced similar discoveries, and this group has henceforth championed the release of all trout and generally led in the fight for modern trout management.

Of all the obsessions which plague trout fishermen, the most persistent is the search for the perfect fly rod. I have owned 27 fly rods which were purchased in the chase for perfection. Don't tell me that there is no such thing as the perfect fly rod. I already know that.

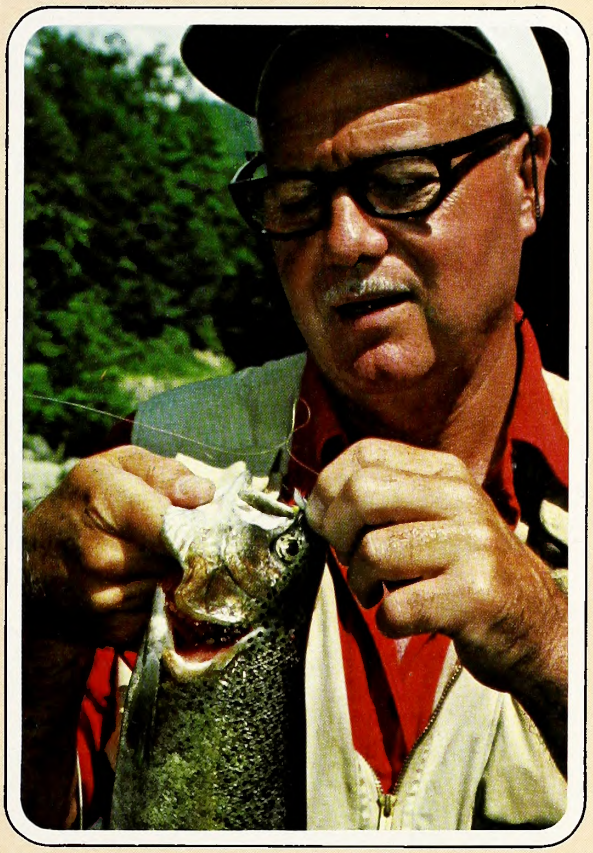
Of course, there are several ways to approach the acquisition of fly rods. Some anglers claim that they are trying to acquire at least one rod for every conceivable occasion. If you measure utility in inch-long increments and stick with rods ranging from four to 13 feet long, you could justify the purchase of 108 rods. Other rod fanciers might not wish to be so tightly constrained. You could claim to be a collector which would give you an open-ended option.

This rod selection matter is further complicated by the variety of materials used. There is fiberglass, bamboo, graphite, and boron to name the most commonly known, and at least one company has revived the old greenheart fly rod (to tap the market of nostalgic anglers who are in excess of 90 years old, have poor memories and fat bank accounts).

If you could find one absolutely truthful fisherman (excepting, of course, myself), he would tell you that 99 percent of the stuff written about rod materials and design is horse spore. He would tell you that his first solid glass fly rod was the equal of any outrageously expensive bamboo rod he had ever owned. Furthermore, he would tell you that, while the new graphite and boron rods are very efficient, they won't offset years of sloppy casting or overcome any ignorance about fishing which has been carefully nurtured.

One friend of mine, upon inspecting a proud owner's new $600 bamboo fly rod, gave what may be considered the only proper and truthful retort. "Well, it's a pretty little piece of wood, but I wouldn't hit a cat in the butt with it. I want a rod that's got enough backbone

Serious trout fishermen are obsessed with solitude, and will go to considerable lengths to find it. This works fine unless you happen to catch a large trout, in which case there is no one to brag to. Since ethics require the release of all trout, the angler is habitually without proof of prowess.



"It would be far easier to equip an entire armored division than to furnish a single fly fisherman with only his most basic needs."

Curtis Wooten

While it is painful to admit, the most successful trout fishing is often accomplished either while sleeping or daydreaming. That is not to say that trout are not caught from time to time, but as with many of man's pursuits, the sport's finest moments may be imaginary. Robert Ruark was close to the truth when he admitted that "Fishing is a state of mind." Rest assured that the above angler will have a thrilling tale of conquest to tell when he finally awakens and returns to his family.

in the tip to open a screen door." Of course, that kind of heresy will get you strung up in the heart of trout country.

The true crazies in this sport are those who tie their own trout flies. Fly tying has been called a "hobby within a hobby," but it is more nearly an "obsession within an obsession." The idea is to construct an almost exact duplicate of an insect using hair, feathers and other materials. This fraudulent insect must be constructed on a fish hook. There is a persistent belief that every trout decides in advance that he will eat only a certain species of insect, and your fly must match that insect precisely. There is just barely enough truth to this to keep you off balance.

What hatch matchers and fly tiers do not like to consider is the fact that many large trout are caught on such items as pieces of hot dog, marshmallows, swiss cheese and Jolly Green Giant Niblets, and I have yet to see a hatch of niblets on any of the creeks I fish.

I confess that I have been a fly tier, but I try to keep things under control. I used to collect my own materials whenever possible rather than buy them, but I had a close call with a topless dancer once when I coveted an ostrich plume which she was twirling over my head. She seemed insulted that I could not take my eyes off that plume, but what the hell. I never did understand women.

There is one part of trout fishing which makes perfectly good sense, and that is the opportunity to be outdoors in the midst of Nature's finest handiwork.

Nothing is as beautiful as a trout stream. The only minor problem is that the portion of the stream I want to see is always at least six miles down — and back up — the steepest, most Godforsaken trail that was ever hacked out of the jungle. Those trails are dangerous, especially at night. I had one friend who fell out of a trail and cracked two ribs. (Didn't spill a drop, either, but that's another story).

Also, it is difficult to observe Nature while leaning against an icy, waist-deep current that is foaming over boulders so slick you'd swear they'd been dipped in mineral oil. To get the proper perspective on this, try roller skating in a chicken yard.

Quite naturally, the payoff is the actual catching of a real live trout, and I have heard of this happening from time to time. Maybe this year, it will be my turn. I just hope my heart can take it.

Letters

Dear Sir:

I am writing to praise you for publishing one of the most outstanding magazines I have the pleasure of subscribing to. The new layout of North Carolina WILDLIFE is excellent and further enhances this publication. The articles and photography are tremendous.

Being a student of Wake Forest University, my time spent in the outdoors is limited to vacations and occasional weekends. A resident of Wilkes County, I have enjoyed all forms of outdoors throughout my almost 19 years. Being in college causes a longing for the outdoors more than ever, and your magazine, which I have subscribed to for several years, aids me in the periods when I must relinquish my outdoor activities.

Again as an avid outdoorsman, I congratulate your staff for a fine magazine which I feel is "a work of art." Keep up the great work.

Shelmer D. Blackburn, Jr.
Winston-Salem

Dear Sirs:

The other night, while oiling up my spinning reel and indulging in some wishful thinking on angling pleasures to come, I thought of a few questions I'd like to ask you folks.

First, is it necessary to have a game lands use permit to fish warm-water ponds and streams on game lands? I know you need one for trout, but what about warm-water species?

Second, is the Wildlife Resources Commission doing anything to improve warm-water fishing on game lands? It seems to me that we should be trying to use these areas year-round.

John Clancy
High Point

The answer to your first question is "no" Mr. Clancy. A game lands use permit is only required for trout fishing on game lands, in addition to a trout stamp if you don't have a sportsman's license. You don't need a game lands use permit to fish in warm-water ponds or lakes on game lands. In reference to your second question, the Commission is managing many of the small warm-water ponds on our game lands. Some of the ponds are stocked with bluegill, bream, largemouth bass and channel catfish. We also add fertilizer to some of the ponds, which increases algal growth and the food base for game fish.

Dear Sir:

I just wanted to let you know that I really enjoyed your article on fishing for Roanoke bass written by Ted Dossett in the March issue. It's very refreshing to read an article published in an outdoor magazine that emphasizes "quality" angling, not just filling a stringer of fish. I'd like to see more of this type of journalism in your magazine, and in other outdoor magazines too.

I have been an avid angler all of my life, and I'm very disturbed at the turn our sport has taken in recent years. The emphasis no longer seems to be on the fishing experience itself, but just in the total poundage hauled in.

The first fish I ever caught was a cutthroat trout in a beaver-dam choked stream in the Colorado Rockies. We rode in on horseback through herds of half-wild range cattle and even saw a few honest-to-goodness cowboys, which was a heady experience for an 11-year old kid raised in a small New England mill town. Since that time, I have fished throughout the Northeast, South and some of the West. The best fishing I have ever had has been done in utmost solitude (casting for bass among the cypress trees of Mattamuskeet, brookie fishing in the Connecticut River in Northern New Hampshire, fishing for pickerel in remote Maine marshes, and salmon fishing in Southeast Alaska). Contrast these experiences with what you get today. Overpowered bass boats roaring from one end of a narrow lake to another. Depth finders, oxygen meters and sonar rigs being used on $10,000 boats to track down a two-pound bass. "Big money" fishing tournaments, where contestants measure their success in total poundage. On many of North Carolina's lakes, fishing is like attending a three-ring circus.

What we need are more anglers like Mr. Dossett who consider fishing a "privilege" and not a competitive sporting event. Trade in your bass boat for a canoe, and try fishing the quiet waters of some of our remote swamps. Wade a few Piedmont rivers in search of jack, Roanoke bass and redeye. Try flyfishing on some of our remote Mountain trout streams, then go back and see if all of the commercialism and competitiveness in today's fishing doesn't leave a bad taste in your mouth. There's nothing like solitude and a little quiet, contemplative angling to clear a man's mind.

Tom Stapleton Raleigh

Dear Sir:

I plowed a warden badge, No. 428 (made in Newark, New Jersey, N.C. Department of Conservation and Development Fish and Game) out of the ground and was wondering if you could check your records as to whom and when it might have been issued.

Thomas H. Barker
Reidsville

We have no records of the badges issued prior to about 1949. If any readers can help, Mr. Barker at 1221 Richardson Drive, Reidsville, N.C. 27320, would be grateful.

Dear Sir:

I really like the "new" look you folks have given WILDLIFE IN NORTH CAROLINA. I have also enjoyed the increased emphasis on environmental articles, especially the article on the problems caused by big farms in eastern North Carolina and the article on the New Hope Lake controversy. I get the impression that you're trying to attract a wider audience of readers, including those who do not hunt or fish. I think that's a good idea because we're all interested in the outdoors whether we hunt or fish or just hike and look. Even so, I want to urge you not to forget those of us who like to hunt and fish. We were the first conservationists, and we're still happily paying the freight for virtually all of the protection and research on wildlife – including wildlife that no one hunts or fishes for.

Keep up the good work.

O.L. Gardner
Charlotte

Dear Sir:

Last fall, I was dove hunting with several friends at a farm in Johnston County. We had permission to hunt, but I am pretty sure that this wasn't the case for two fellows who stopped and started hunting in the same field. Also, these two people – I don't want to call them hunters – never picked up any of the doves they killed, and I'm quite sure they killed more than the legal limit.

I wanted to get in touch with a wildlife enforcement officer, but didn't know how to do this. What should I do if something like this happens again?

Name withheld on request

The easiest way to report a violation is to call the N.C. Wildlife Resources Commission's toll free hotline in Raleigh which is normally manned from 8 a.m. to 12 p.m. seven days a week. The number is 1-800-662-7137.

Natural Heritage Program Saving State's Wild Lands

Nature Conservancy helps out!

Roan Mountain, Bald Head Island. Parts of the Currituck banks. Jockeys Ridge. These are just a few of the areas that the North Carolina Natural Heritage program, working as part of the N.C. Department of Natural Resources and Community Development, has helped preserve in the two years of its existence.

"The role of the Natural Heritage program is to identify and inventory North Carolina's outstanding and unique natural areas," explains Charles Roe, coordinator of the program. "We try to find representative areas of all the different ecosystems within the State as well as areas with special natural features."

The Natural Heritage program usually works closely with the Nature Conservancy, which is a citizen's conservation organization. The Natural Heritage staff starts by identifying areas throughout the State that should be preserved, then the Nature Conservancy will often work with individual landowners or governmental agencies to reach an agreement to keep the land in a natural state. Much of the land in the program is part of National and State Forests, Wildlife Commission game lands, and State Parks.

"When we find an area in private ownership that has unique natural values, we try to convince the landowner to keep the area in its natural state," said Roe. "The agreements we make when we enroll an area in our Registry of Natural Heritage Areas are based on good will and are non-binding and non-regulatory, and the land stays in private ownership." The landowner isn't losing any control over his property when he enrolls it in the Natural Heritage program.

"We see no conflict with hunting on natural areas," added Roe. "This type of recreation is compatible with the values we're trying to preserve. Many of the natural areas in North Carolina's coastal regions were saved by waterfowl hunting clubs, and sportman's clubs in the Mountains have protected other unique wild areas."

For more information on this program, write to the Natural Heritage Program, N.C. Department of Natural Resources and Community Development, P.O. Box 27687, Raleigh, N.C. 27611.

For information on the Nature Conservancy, write to the N.C. Nature Conservancy, P.O. Box 805, Chapel Hill, N.C. 27514.

December Enforcement Report

For the month of December, 1978, the N.C. Wildlife Resources Commission checked a total of 24,818 hunters and fishermen and 351 boaters.

Of the hunters and fishermen, 1,590 were prosecuted and 1,402 convictions were obtained. The total fines collected were $23,908 and the total costs collected were $31,380.

Of the boaters, 274 prosecutions were made and 233 convictions were obtained. Total fines collected were $627 and total costs collected were $5,545.

Other prosecutions totaled 35 and convictions totaled 27. Total fines collected were $474 and total costs collected were $652.

All fines and any arrests or witness fees were paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected were paid to the N.C. Wildlife Resources Commission or its personnel.

Large Poaching Ring Busted In Detroit

One of the largest commercial poaching rings discovered in recent years has been broken up in suburban Detroit by wildlife agents from the federal government and the Michigan Department of Natural Resources.

Poachers were selling wild game, fish and waterfowl through several retail meat markets in Detroit. The prices paid by customers for wild game often exceeded the price of domestic beef.

The poachers had sold over 300 deer, 1,700 squirrels, 4,400 ducks, 11,000 rabbits and thousands of pounds of walleye and bass before they were caught. Other species killed and sold by the poachers included badgers, raccoons, red fox, pheasants, partridge and Canada geese.

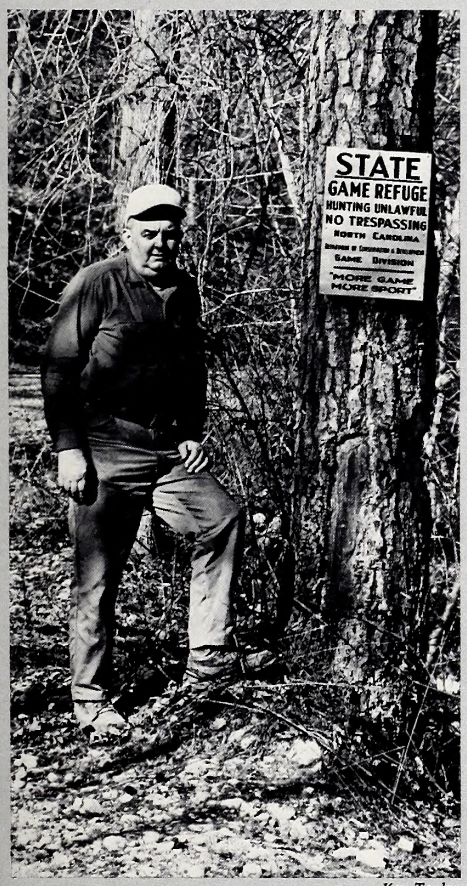
Safe Boating Week Slated

Safe recreational boating is the goal of National Safe Boating Week which is slated for the week of June 3.

Voluntary safety inspections and courtesy marine inspections will be held for craft from 14 to 65 feet long throughout the State by the Coast Guard Auxiliary units. Courses in safe boating are also offered through the U.S. Power Squadron and the Red Cross. A course designed especially for young people is offered through the schools by the N.C. Wildlife Resources Commission.

For further information, contact boating organizations, the Coast Guard or its auxiliary units, or the N.C. Wildlife Resources Commission, Division of Boating, 512 North Salisbury Street, Raleigh, N.C. 27611.

Ollie Thompson: Last Of The Original Wildlife Officers



Ken Taylor

Ollie Thompson, a longtime enforcement officer for the Commission on the Uwharrie Game Lands, is back in "civvies" again now that he has retired.

Ollie Thompson remembers the dates of his wife's birthday and his wedding anniversary, plus two others.

Those dates are November 1, 1944, and February 1, 1979. These dates mark the beginning and end of Thompson's 35-year career as game warden, wildlife protector and enforcement officer.

Thompson's retirement also marks the end of an era for the N.C. Wildlife Resources Commission. He is the last officer who was on the job working as game warden for the State Department of Conservation when the Commission was formed in 1947.

Thompson has seen lots of improvements in wildlife protection since he started work on a temporary basis back in 1944.

"When they made me a game warden, they gave me a badge and told me to go to work," Thompson recalls, "I had to furnish my own gun and there weren't any uniforms in those days."

The only training he received in the beginning was oral instruction from supervisors. That changed in 1950 when the young Wildlife Resources Commission began a training program for enforcement personnel at the Institute of Government in Chapel Hill. Thompson attended the first class and feels that this was one of the best moves the Commission ever made in helping improve game law enforcement.

Since he has lived near the Uwharrie Game Lands all these years, Thompson has been highly interested in the deer herd there and statewide. Stocking deer on Uwharrie in 1944 was one of the most satisfying things Thompson has ever done.

Thompson is happy that judges are now more concerned with game laws than they were in the past. As an example, he recalls warning a hunter last year about having a firearm in his truck during a night hunt for raccoon. The same fellow was apprehended a few months later with a deer he'd shot at night and was found guilty in court.

"The judge asked me if I had ever had any trouble with the man, so I told him about the warning I'd given him the previous year," Thompson recalled. "The judge fined the man $300. I think that shows an improvement in the court's attitudes toward game law violators."

All the work hasn't been issuing citations, and sometimes there was a lighter side. Thompson recalls locating two lost hunters one cold, snowy night way back in the forest about two miles from his truck.

"It was funny because the first thing one of the fellows asked me was if I had a telephone," Thompson said. "He wanted to call his wife because she didn't know where he was."

"I told him to come on and let's get out of here, because my wife didn't know where I was either."

Greensboro Daily News
by Bodie McDowell

Mountain Fish Get New Grub

Fishery biologists from the N.C. Wildlife Resources Commission hope to improve sport fishing in North Carolina's large Mountain lakes by introducing tiny new food organisms into the waters from the deep lakes of Michigan and Ohio.

According to Jack Wingate, Mountain region fisheries research coordinator for the Commission, the stockings are part of a ten-year project designed to increase the size and number of game fish in Mountain lakes by increasing their food base.

The introductions will include certain benthic organisms and several species of zooplankton. Benthic organisms are the insects, worms and other aquatic life that feed on decaying organic matter found on the lake's bottom. Zooplankton are small animals that float free at all levels of the lake and form a major portion of the diet of young fish.

North Carolina's Mountain lakes are relatively low producers of feed for fish because the waters lack the nutrients necessary to produce large numbers of aquatic insects and other life. The water is also too cold to support much of the aquatic life that is native to this region. Another problem is the lack of fish cover and "structure" in the lakes. Biologists hope to remedy this situation by working with angler's clubs to install fish hides and artificial reefs.

The three lakes included in the project are Nantahala, Fontana and W. Kerr Scott Reservoir. Currently, biologists are sampling fish and aquatic life populations in the lakes to give them some "base line" data. Future sampling will then be done after the stockings and compared to this base line data to see if the project is working. Lake James will be stocked with the new organisms from Ohio and Michigan late this spring, Lake Fontana will be stocked in 1980, and W. Kerr Scott Reservoir will be stocked in 1981.

"We don't expect to see trophy-sized fish clamoring to get into angler's boats as a result of this experiment," said Wingate, "but an improvement in fishing in these lakes should be noticeable within a few years following the stockings."

Curtis Wooten

Quality Of Life Continues Downward Plunge

The quality of life in the United States has declined over the past decade, according to the National Wildlife Federation. The Federation recently published a summary of each annual Environmental Quality Index for the last ten years. Of the seven indicators used to measure the health of our environment, only air quality has improved. Forest resources have remained stable, and wildlife, living space, water quality, minerals and soil have declined in overall quality.

Air quality has improved since 1968 as a result of new laws restricting air pollution. Today, about 90 percent of the nation's factories are meeting federal emission standards. Yet, Honolulu is the only city of the nation's 195 largest urban areas that has air that is considered healthy to breathe. The battle for clean air is expected to grow tougher in the future as power stations switch from burning "clean" oil to "dirty" coal.

Forest resources have remained stable. Stricter control over logging operations has reduced much of the siltation, erosion and aesthetic problems caused by poor timber operations. Yet, the competition among users of the forest is fierce. Both logging and recreation have increased 300 percent on our federal lands since 1953. The demand for timber is expected to continue to grow and foresters are switching to "whole tree" utilization and developing new products to help meet that need.

Living space is also "worse" than it was ten years ago. Comprehensive land-use planning is needed, but only nine states have implemented such planning programs. A national land-use planning bill has been defeated twice in Congress.

illustration by David Saholsky

Water quality is poorer than it was ten years ago. Many rivers have benefited from clean up programs of specific industries, but other problems are becoming apparent. Nonpoint source pollution, which includes the runoff from city streets, highways and agricultural areas, has only recently been recognized as a massive problem. Scientists estimate that up to half of the pollutants entering our waterways are coming from nonpoint sources. The compounds found in this runoff often include heavy metals which are very toxic and very difficult to remove.

Water scarcity has also reared its ugly head. About one-quarter of the nation is using water faster than nature can supply it. This problem is especially critical in the southwest, although the east coast's urban belt is beginning to feel the effects of a shortage. While water supplies dwindle, virtually no efforts are being made to conserve this precious resource. The average American family flushed 40,000 gallons of water down the toilet last year, while Scandanavian toilet systems are available that use little or no water, but compost the waste instead.

Problems are also evident with our mineral supplies. Although recycling metal costs only five percent of what it takes to mine and process virgin ore, 70 percent of the metal in this country is used only once and discarded.

As for soils, in the last 25 years, we've lost about one-third of our topsoil to erosion. We're also trading cow pastures for asphalt pastures. Fifteen million acres of farmland have been lost to development in the last decade.

Wildlife is being threatened by rapid loss of habitat. Certain game animals that are easily managed and adapt readily to man have fared well. Yet animals that need large blocks of wilderness and solitude, like the grizzly bear, have declined despite our efforts to protect them.

WILDLIFE
IN NORTH CAROLINA

SEND CHECK OR MONEY ORDER TO:

Wildlife in North Carolina
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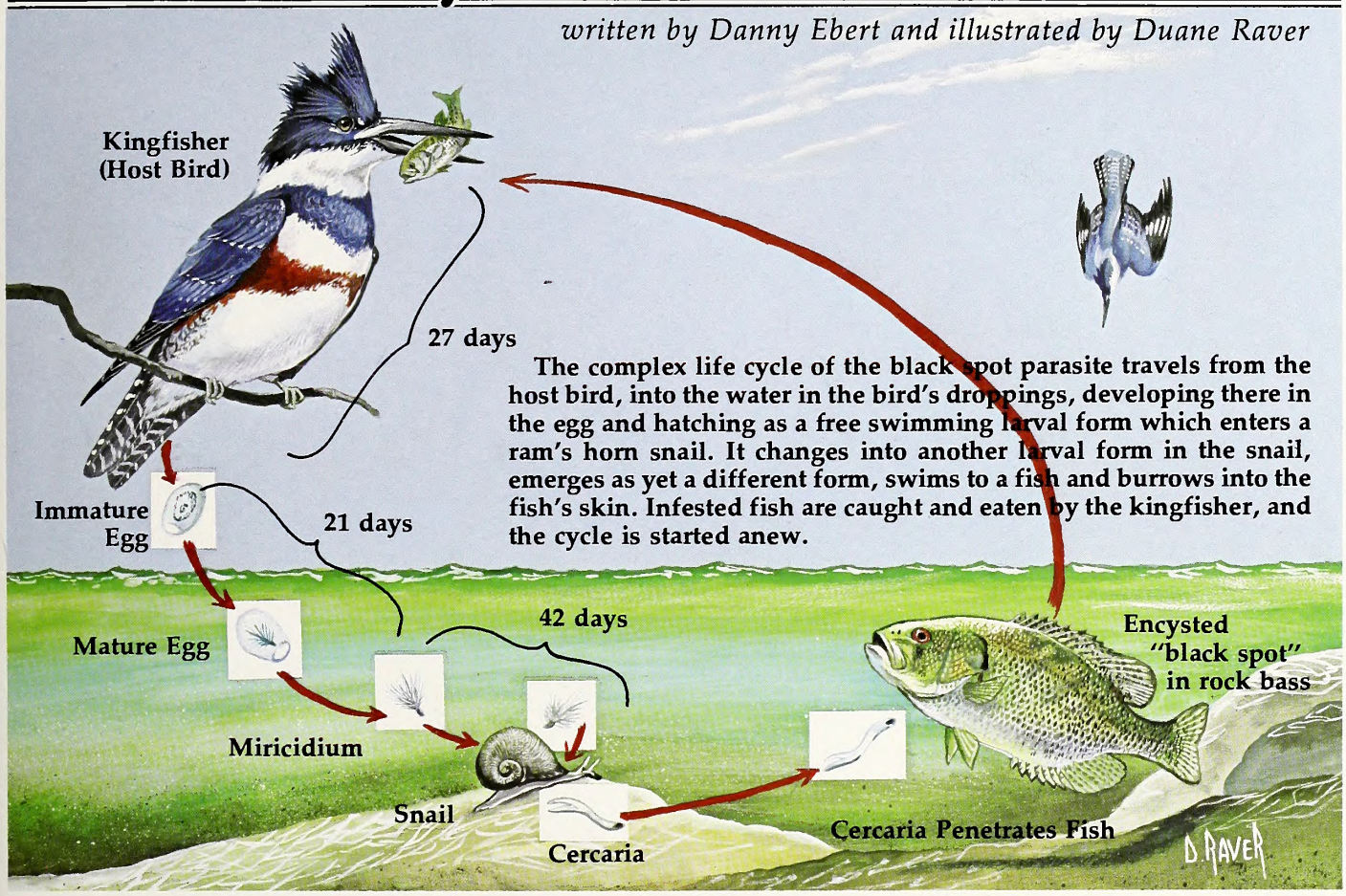
Nature's Ways

The Black Spot Connection

written by Danny Ebert and illustrated by Duane Raver



While canoeing along the New River last summer, I noticed the relative ease with which a fly fisherman was working his line in and out like a giant, yet delicate, bullwhip. The heavily laden stringer attached to his belt was proof of success. I recognized several good-sized rock bass, a couple of smallmouth bass and a few other sunfish. I called him over to learn his secret, and it was then that I noticed that the fins and tails of several of his fish were covered with black spots. We talked about what these spots might be — discoloration of the skin, a disease, baby clams attached to the skin, or possibly some type of external parasite.

The affliction, however, was black spot disease, and it is very common in streams, rivers and ponds in the southern Appalachian region. Strangely enough, it takes the unlikely combination of fish, snails and kingfishers to produce the conditions which cause this fish disease.

In the water world, there is a great variety of fish and invertebrates (animals without backbones). When some of these animals come into contact, parasites may present a problem. Among the parasites commonly found in and on sport and forage fish in our area are the *trematodes.* These parasitic worms use fish and other aquatic animals for food and shelter while completing their lives.

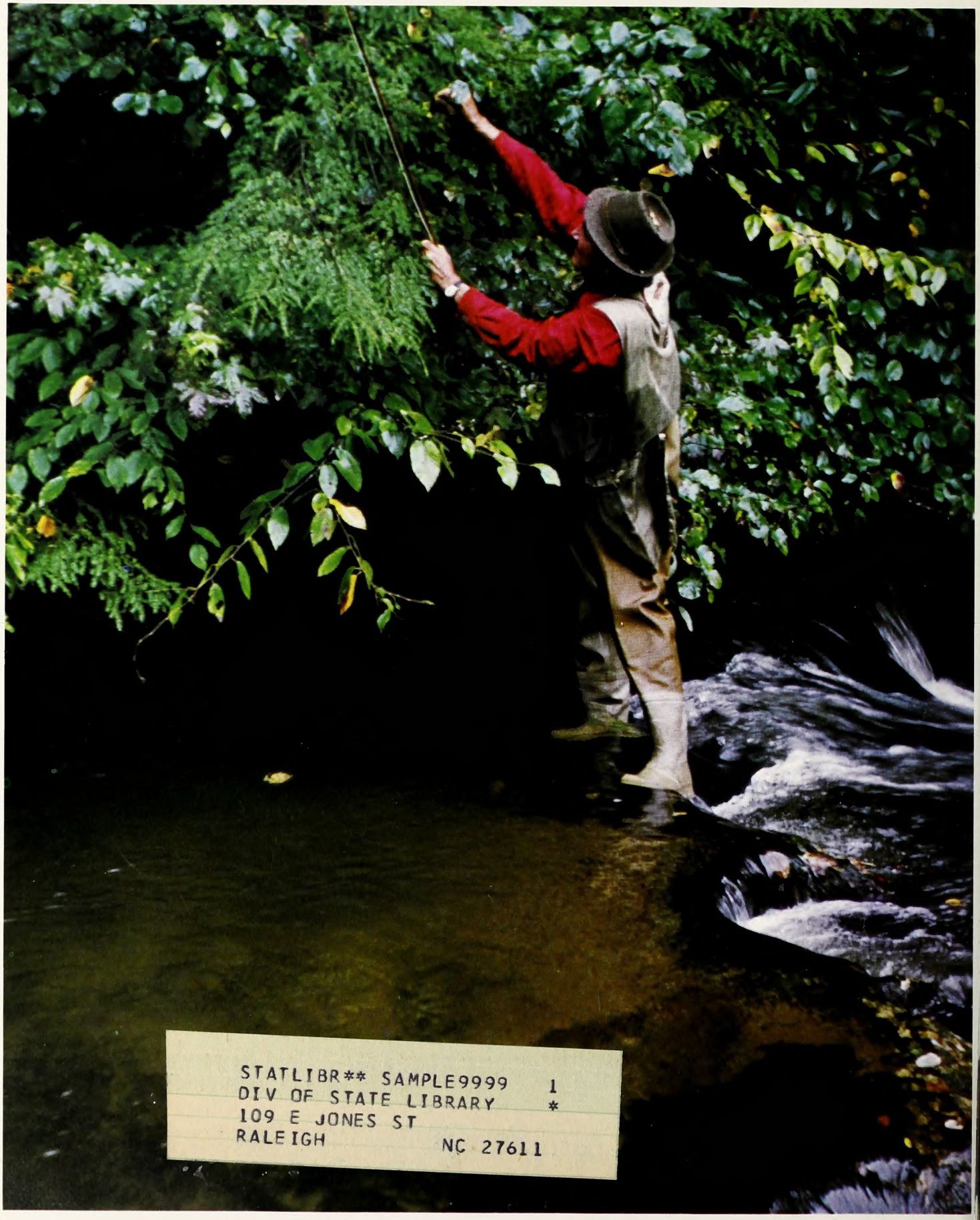
Some of these trematodes (flukes) cause black spot disease in minnows and various sport fish. Many anglers believe that fish afflicted with this group of parasites are useless or tainted when these tiny creatures become attached to the fish's outer skin. This is not the case.

The flukes, as adults, occur in the digestive tracts of birds, especially belted kingfishers. The life cycle of the worm begins when the eggs are laid by adult worms in the digestive tract of the kingfisher. The flukes' eggs are passed into the water in the bird's droppings. Under favorable conditions, the eggs hatch in about three weeks. The young worms burrow into a particular kind of snail — the ram's horn snail — which is required by the flukes for continued growth and development. It is important to note that if either the kingfisher or the ram's horn snail is absent, the flukes' life cycle cannot be completed.

After growing for six weeks in the snail, the young worms swim from the snail into the water. These young parasites are weak and must rest after swimming short intervals. When they come into contact with a fish, the young worms attach to the fish by penetrating into the fish's skin. The worms then drop their swimming tails, and secrete a nearly transparent cyst or covering around themselves. After about three weeks, the fish has secreted black pigment around the cysts containing these worms. These black cysts, as the name implies, are called black grubs or black spot.

After eating infected fish, kingfishers become infected when encysted young trematodes on the fish break out of their cysts and attach to the bird's digestive tract. There the worms mature further, completing their life cycle.

Although there is no definite treatment for fish afflicted with this ailment, the disease can be kept in check by eliminating the snails from the pond; however, this should be done *only* with professional help.



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Trout fishing is a rich blend of agony and ecstasy, and even the best fly casters may spend as much time extracting flies from trees as they do unhooking a handsome rainbow trout.

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WILDLIFE IN NORTH CAROLINA

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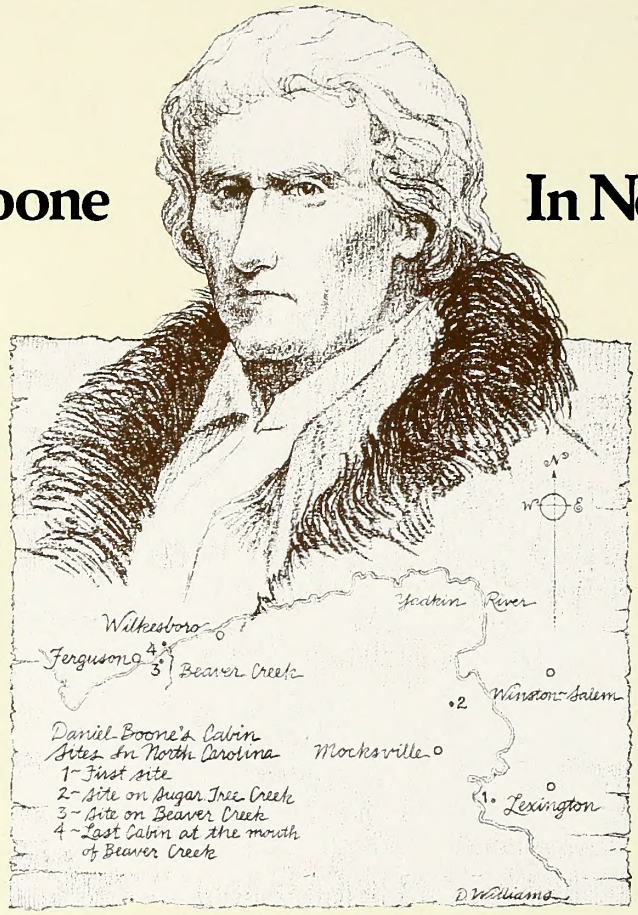
Our Natural Heritage

by Jim Dean

illustration by David Williams

Daniel Boone In North Carolina



Think of Daniel Boone and you think of Kentucky. You may also think of the Wilderness Road, Cumberland Gap, Boonesborough, long rifles and trees carved with messages about "bars cilled." It is highly unlikely, however, that you would associate Daniel Boone with North Carolina; yet his roots in the Tar Heel State run deep.

In the spring of 1750, Daniel Boone accompanied his parents and other members of the family on a long trek from Berks County, Pennsylvania to North Carolina. The Boone family arrived in Yadkin Valley either in 1751 or 1752 (historians are not certain about the date). Records show that, in December, 1753, Daniel's parents, Squire and Sarah Boone, bought land on the Yadkin River between Mocksville and Lexington in what is now Davidson County.

At that time, Daniel was barely 19 years old; and aside from frequent excursions, he lived in North Carolina for roughly 20 years until 1773 when he led six families, including his own, into the wilds of Kentucky to establish a settlement.

When the Boone's arrived in the Yadkin Valley, they found a country nearly as untamed as the land west of the Appalachians. Only 2,500 people lived in the entire colony, and game was plentiful. Even buffalos still roamed part of the State. There were also squabbles with Indians, especially during the period from 1758-1760 when the Cherokees sought revenge for the killing of several of their people.

Young Daniel, like other members of the Boone family, was a wanderer; and throughout his stay in North Carolina, he explored the western part of the State, making occasional forays into other parts of the country, including Kentucky and Florida. Yet, for two decades, his home was North Carolina, and his long-suffering wife, Rebecca (whom he married in 1756), tended it during his lengthy absences.

Actually, Daniel Boone lived in at least four homes in North Carolina. His father, Squire, built the previously mentioned first cabin on the east bank of the Yadkin roughly four miles from Churchland off N.C. Rt. 150. In 1909, the Daughters of the American Revolution erected a granite monument on the site, and citizens reconstructed the cabin and established a small park, but unfortunately, it was destroyed by vandals.

The Boones lived in that first cabin only a year or so; and in 1753, they crossed the Yadkin and acquired land on several creeks in what is now Davie County. Historians believe that Squire Boone built this second home on Dutchman's Creek north of Mocksville. After his marriage to Rebecca, Daniel first lived in a cabin in Squire's yard, but soon built a cabin on Sugar Tree Creek, a tributary to Dutchman's Creek. This site has also been identified about two miles east of Farmington off Rt. 801.

In 1765, Daniel went to Florida and liked the area well enough to buy a house and lot in Pensacola, but Rebecca refused to move there; and shortly after his return to Sugar Tree Creek, Daniel temporarily moved west to Holman's Ford on the upper Yadkin west of Wilkesboro. Still unsatisfied, he moved five miles farther up the river and settled about one-half mile up Beaver Creek east of Ferguson near Rt. 268. Again, he was not satisfied, and soon moved to his final home in North Carolina across the Yadkin River opposite the mouth of Beaver Creek.

T.W. Ferguson, whose family first settled this area about 1750, submitted a sworn affidavit in 1952 that he had seen evidences of the old chimney and hearth stones of the Boone homesteads in the area, both shown to him by his father and other older residents.

It was from this final North Carolina home at the mouth of Beaver Creek that Boone launched his final move to Kentucky. In 1767, accompanied by William Hall and probably his brother, Squire, he crossed into Kentucky, but returned only to venture forth again in 1769 in a party with another explorer, John Finley. Boone returned in 1771; but by the fall of 1773, he had decided to pull up roots again and head west. This time, he took Rebecca, along with five other families. By the spring of 1775, Boone was again settled, this time at Boonesborough in Kentucky, and his long ties with North Carolina were over — and oddly enough, virtually forgotten.

WILDLIFE IN NORTH CAROLINA

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The bluegill may be North Carolina's most popular game fish, and it's certainly the most common species in this State's estimated 80,000 farm ponds.

Back Cover *Photograph By Doug Elliott*
Bloodroot blooms in early spring, and is one of the plants used in the manufacture of pharmaceutical preparations.

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Jigging For Stripers

Try this deep-jigging technique for stripers in Kerr, Gaston, Norman and other Tar Heel rockfish lakes.

By Pete Elkins

It's as old as a carved ivory hook glinting in the green cold water below a hole in the Arctic ice. Yet, it's as new as the flashiest metalflake bassboat replete with electronic gadgetry. "It" is vertical jigging, the simple process of lowering a lure straight below a boat and jerking it up and down.

However, this simplistic definition is akin to describing Barbara Streisand's singing ability as nothing more than exhaled air vibrating vocal chords. The nuances of vertical jigging are many.

Until the recent and rapidly increasing interest in fresh-water striped bass, vertical jigging was rarely used in fresh-water impoundments. There were a lot of us who jigged for crappies, but we didn't really know that we were "vertically jigging."

A few others have used the method all along, mostly for white bass during summer and winter. When the big striper boom began, the same methods were perfect for these beautiful game fish.

Of all fresh-water game fish, stripers are the ideal vertical jigging targets. There are many reasons why stripers are particularly susceptible to vertical jigging. Stripers frequently suspend at intermediate depths over much deeper water, especially during extreme heat or cold conditions. Stripers forage primarily on threadfin or gizzard shad. A jigging or "structure" spoon like the Hopkins "Shorty" functions as a perfect shad imitation.

During the last year, almost every striper that I've taken on Hopkins spoons has been bulging with small shad of almost identical proportion to the spoon.

Stripers are also, by virtue of their large average size, easily detected by sensitive depthfinders. Good flasher models readily reveal suspended stripers. Anglers experienced in the use of a well-made depthfinder can even spot stripers in belly contact with the bottom. Graph recording depthfinders, while more expensive, are far easier to use.

These factors, combined with the unpredictable feeding habits of stripers, make vertical jigging the fastest, most efficient way to present a lure within feeding range of stripers.

On good striper lakes like Kerr, Gaston or Norman, fish are easily located by depthfinders. Unfortunately, locating a school of stripers doesn't assure strikes. Odds for success are multiplied if the angler can rapidly place a lure on as many striper noses in the shortest practical time. Some of the fish will strike. Vertical jigging permits rapid and thorough lure presentation.

Prior to actually searching for stripers, a would-be striper jigger needs some basic equipment. Boats are essential. Design is a matter of choice, but anglers should remember that some of the best striper fishing occurs during windy weather in open, exposed portions of large lakes. Beam, stability and adequate freeboard are reassuring features.

Bow-mounted electric motors are as important for vertical jigging striper anglers as for shoreline largemouth casters. With a good electric, it's possible to remain in contact with a school of fish.

Really serious striper anglers mount a depthfinder transducer on their electric motor. This arrangement provides instant awareness of what's directly below. The ideal arrangement is a console-mounted graph recorder with transom transducer and flasher unit mounted on the bow. The graph quickly locates the fish, and the flasher facilitates pinpoint lure presentation.

On many occasions, I've watched the red blips of stripers converge on the smaller blip of my jigged spoon seconds before a wrist-wrenching strike. Depthfinders may be gadgets, but they're useful and add another dimension to fishing.

Like boats, rods and reels for vertical jigging are purely personal preference items. Generally, free-spool casting reels provide a bit more strike sensitivity than open-faced mills. Graphite rods are definite pluses. Line size should be geared to water conditions. In a lake with some water "color", heavier mono in the 15 to 20

photography by Pete Elkins

pound class is fine. Don't be afraid to drop down to eight pound test in extremely clear water.

Most vertical jiggers favor structure spoons or bucktail jigs. Some plugs will produce when vertically jigged. The "spot" and "sonar" types immediately come to mind. Still, spoons and jigs are what vertical jigging is all about.

Anyone who has spent a lot of time with stripers should know better than to advance any firm rules. But here goes! Spoons are superior under cold water and sunny conditions. Jigs often excel in warm water and overcast conditions. Now that the theory is out, don't hesitate to violate it. Stripers are fickle creatures.

Expert jiggers prefer jigs dressed with bucktail rather than maribou. Favored sizes vary from 1/8 ounce to an ounce or more. As a general rule, the smallest practical jig is usually most effective. White or yellow usually cover the waterfront. There are occasions when some exotic hues like chartreuse or even red produce strikes. A green and white bucktail has always been productive for me, but I confess to bias for that combo.

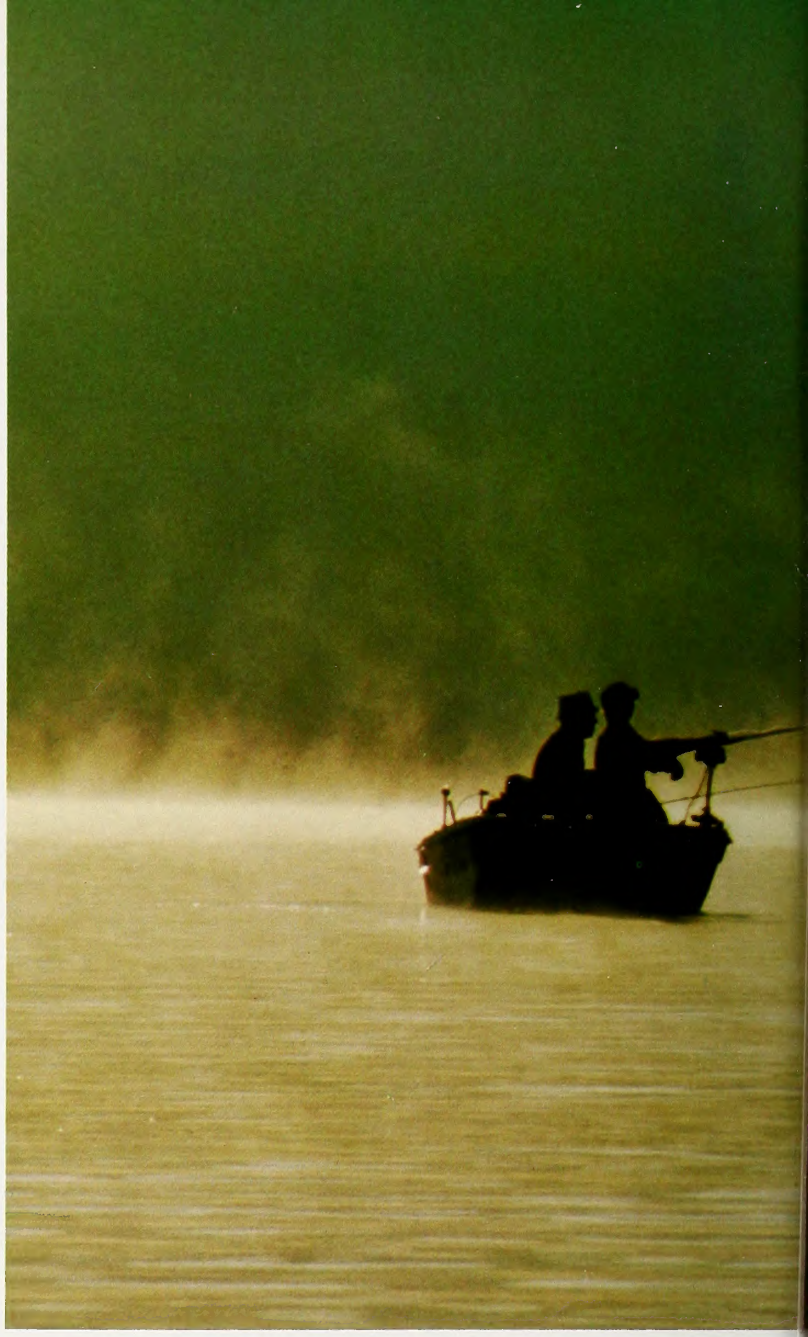
Some knowledgeable striper jig artists always embellish the jig's hook with porkrind or a curly-tailed plastic worm. If the stripers are holding much below thirty feet, hook embellishments dampen some of the "feel" so critical to detecting soft strikes. This problem is particularly acute with jigs weighing less than 3/4 ounce when wind is moving the water.

Spoons are easier to "feel" than jigs. For that reason alone, I usually go with spoons first, switching to jigs only if spoons draw a blank. There are many excellent jigging spoons available for the fast-growing fresh-water striper fishing ranks. The Hopkins "Shorty" 3/4 ounce stainless steel spoon heads the list, both in durability and effectiveness. Other proven striper spoons include Bomber "Slabs," Bagley's "Salty Dog," Cordell's "Topo", and Mepps' "Striper Killer."

Whatever the choice, the addition of a small split ring to the spoon's eye enhances action. Some jigging spoons are manufactured with relatively thick, dull hooks. While strong, these hooks are best replaced with lighter wire trebles. The lighter trebles will increase spoon action and the thin hook points will penetrate rapidly even with slack line and mono stretch. Admittedly, lighter trebles will bend if your drag is set too heavy. But trying to stop a large striper's first frantic lunge invites trouble anyway. There's far more danger of losing a big fish from hooks tearing through jaw tissue rather than straightening when too much pressure is applied.

After locating the stripers, the jigging process is relatively simple. Depending on the stripers' location, the spoon or jig should be free-spooled to the bottom or "Counted down" to the suspended stripers' depth. Obviously, depthfinders are essential to consistent vertical jigging results.

"Counting down" is easily accomplished by marking the rod's butt section with bright tape at either one or two feet from the reel, then lowering the lure by measured strips. With a bowmounted depthfinder transducer, it's often possible to watch the lure fall, and stop it at an exact depth. Some anglers gauge depth by counting shuttles of a levelwind casting reel. Of course, this method requires prior counting of feet per shuttle and may vary a bit depending on the amount of line on the spool. continued on page 7



Early morning mist shrouds these fishermen as they cast for stripers. At times, stripers feed on threadfin shad and other fish on or near the surface. At other times, vertical or deep jigging is more likely to net you a memorable catch.

The Fish Made To Order

By Mark Taylor

You find good saltwater fishing i some of the darndest places thes days. Like in the red sandston deserts of Arizona and New Mexic Or on the high plains of Texas, Kar sas and Oklahoma. Or in the rollin bluegrass country of Kentucky an Tennessee. Why, there's even goo

altwater fishing in Piedmont North nd South Carolina!

In all of these places, sweet-water nglers are gearing up to do battle vith one of our finest saltwater game ish — the striped bass. Now in the past, stripers were always considred the exclusive domain of Hateras Heavers, Chesapeake waterhen, crusty Cape Codders and other aline types. But a combination of ortunate circumstances and good sheries management has made the triped bass one of the hottest pisatorial propositions going in fresh vater throughout the nation.

The story of the striped bass as a esh-water species starts in North nd South Carolina in the 1940s and 950s. Biologists had always beeved that stripers could never live out their life cycle and reproduce in fresh water. Santee-Cooper and Kerr Reservoirs proved this assumption false.

Biologists with the South Carolina Department of Wildlife and Marine Resources were surprised to see stripers turning up in creel surveys on the Santee-Cooper impoundments in the early 1950s. The fish that were trapped in the impoundment when the Congaree River was dammed in the 1940s were supposed to die, but they didn't. They not only were alive but were thriving and reproducing in a completely freshwater environment. The same thing happened when Kerr Reservoir was impounded in the early 50s. A group of stripers that had been part of the Roanoke River-Albemarle Sound population was trapped behind the dam. The fish started running up the Dan and Stanton rivers in Virginia to spawn and soon established a separate landlocked population.

But Santee-Cooper and Kerr Reservoirs were different from most other impoundments. Stripers need a long stretch of free-flowing river to spawn successfully, and very few impoundments fill this need. Striper eggs are free-floating; and if the river isn't flowing rapidly over the spawning beds, the eggs sink to the bottom, become covered with silt, then suffocate and die. It takes from two-to-four days for the floating eggs to develop into fry that can control their movements; and if the eggs wash into a quiet lake before this occurs, they'll settle out and die.

The Fish Made To Order

South Carolina's biologists developed the techniques that turned the striped bass from a landlocked curiosity in a few isolated lakes into a feasible fishery that would take the South and Southwest by storm and help solve some of the region's most pressing fisheries problems.

The technique is a form of artificial spawning. Egg laden females are captured on their spawning runs and injected with a hormone that causes ovulation. After the injection, the female is stripped of her eggs and the eggs are fertilized with sperm "milked" from male stripers, and then placed in large glass jars. Water is circulated through the jars, simulating the flow of a free-running river. When the eggs develop into fry capable of controlling their own movements, the fish are moved into outside hatchery ponds. This usually takes about three days.

"The hormone injection treatment was the big breakthough needed in fresh-water striped bass management," said Richard Guier, head of the N.C. Wildlife Resources Commission's striped bass program. "This eliminated the need for natural spawning and made it possible to rear striped bass in a hatchery on a large scale."

Shortly after the eggs hatch, the fr are placed in outdoor hatchery pond for 30 days before being stocked. Th fry feed on microscopic plants an animals found in the water, and thi food is cultured by adding fertilize and soybean hay to the rearin ponds. After 30 days, the fry begi feeding on larger plants and fresh water animals. At this point, the fis are able to fend for themselves in th wild.

"Striped bass programs are ver economical because the fish aren kept in the hatchery very long," sai Guier. "Feed costs are almost zer because the fish eat plants and an

This fine trio of stripers is proof that vertical jigging can pay off, and the types of lures that work best will include forged spoons, weighted jigs of various types, and a few plugs or lures which may lend themselves to jigging. The author believes that graphite rods are a valuable asset for jigging because of their stiffness and sensitivity.

mals found in the water. The tiny stripers also tie up very little hatchery space because they're kept at the hatchery only from the time they're eggs until they reach about two inches in length. They're raised in the early spring and are shipped out after 30 days, and we can use the ponds again for largemouth bass and other fish throughout the late spring and summer. This reduces the need to expand our facilities and gives us very efficient use of our available space."

At a time when the costs of some hatchery programs are almost prohibitively high, the striper is a real

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While lowering the lure, regardless of the depth gauging method used, maintain some pressure on the spool. I've experienced some awesome backlashes when a striper struck a spoon 10 feet above where he was supposed to be. If you're like me, when something like that happens, you immediately set the hook with the reel in freespool. Monofilament anarchy ensues!

When the lure reaches the desired depth (canny striper jiggers like to initially position the lure three to five feet below the fish), engage the reel and begin an up and down jigging routine.

A rod lift of three to five feet is a good way to start. Remember that the only purpose of the lift, especially with spoons, is to permit the lure to fall afterwards. Virtually all strikes occur as the lure falls. Thus, it's essential to avoid unnecessary slack line.

Successful vertical jiggers learn to "feel" the lure back down with just enough line pressure to maintain lure contact, yet not enough to inhibit lure action. The best way to learn the process is to "follow" the lure back down with the rod tip.

The rod tip should be almost touching the water when the jigging process is started. Then, if, as the rod is being lowered after the lift, the line suddenly goes slack before the rod tip has again reached the water — strike! Many strikes are that subtle. Cold water stripers often inhale a spoon or jig with far less tactile message than a bluegill nipping a plastic worm. I'm consistently amazed at how softly some large stripers take a vertically jigged lure. Apparently, a striper merely engulfs the lure as it falls, creating virtually no lure or line shock in the process.

The shock starts when you lift the rod!

Successful jiggers vary their routine. There are times when a very high lift is irresistible to stripers. This "high lift" method is at its best when stripers are suspending below large shad schools. Bottom hugging and cold-weather stripers usually respond to a more moderate rod lift.

All thoughts of rod lifts, lures, and other subjects are meaningless until stripers are actually located. The importance of depthfinders cannot be overemphasized. However, your search can be narrowed in several ways.

First, talk to local marina owners or other anglers. You're looking for reports of recent striper activity areas. If you can determine their general location as of a day or so before your fishing excursion, a depthfinder should take care of the rest.

Admittedly, there are some occasions when stripers can be taken by vertically jigging without a depthfinder. This usually occurs when several boats are over the fish and successful anglers are charitable with depth information. For example, on a few days last summer at Kerr Reservoir, stripers were consistently feeding at 25 feet. That's all you need to know. However, if the fish move or change depth, as they invariable will, then a striper angler without a depthfinder is blind.

Vertical jigging is far from the total answer for freshwater stripers. Topwater action offers peak excitement. Live bait presentation and trolling have their innings. But vertical jigging is about as consistent as anything can be in the world of a superb game fish whose inconsistency makes it the most challenging target in freshwater.

Pete Elkins is author of the book, "Catching Freshwater Striped Bass," and a free-lance writer from Columbia, S.C.

EVINRUDE

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blessing. But that's not the fish's only asset. The striper was made to order to fill the new fisheries needs of the South.

"The federal government has been building huge reservoirs for power generation and water storage across the South and West since the end of World War II," said Guier. "Some of these impoundments are like inland seas. Because of the nature of our native fresh-water fish, a new introduction was needed to furnish good fishing in these artificial lakes."

The largemouth bass and the chain pickerel are the dominant fresh-water predators in the South. Both of these fish evolved in river environments with hunting habits to match. They're solitary predators that prefer to lie in ambush under a log or brushpile and let their prey come to them instead of chasing it down. In man-made reservoirs, where the bottom was usually scraped as clean as a pool table during construction, bass and pickerel spend considerable time near the shoreline where good cover is available. At the same time, the gizzard and threadfin shad populations prefer open water when it's available. This means you may have good bass fishing around the fringe of many reservoirs and a huge "empty space" in the middle where the shad breed to their heart's content.

"We needed a free ranging, schooling, ocean predator to hunt the huge expanses found in these reservoirs," said Guier. "The striped bass fits the bill perfectly. Stripers hunt as a school, covering huge areas of open water. When they find some shad, the whole school of stripers benefits, making them very efficient open water predators. In the ocean, most of the predators hunt in packs or schools, like mackerel and bluefish. If only one striper hits a school of shad, the other stripers in that school will soon know it and benefit. We're not sure how schooling fish communicate, but they do and they behave as a group."

Contrary to popular opinion, stripers do not compete with bass or eat bass to any extent. Stripers occupy a different ecological niche. While bass are often concentrated in the heavy cover along the shoreline or on some sort of structure where gizzard shad are seldom found, the stripers share the open water with the heaviest shad concentrations. Bass and stripers just don't have as much contact with each other as some fishermen suspect.

According to Guier, a good striper population in an impoundment can actually improve bass fishing.

"A good striper fishery helps bass in several ways," Guier said. "Stripers can easily reach 20-to-30 pounds in a large lake so they reduce fishing pressure for bass considerably. While "good" stripers average 10-to-15 pounds, a bass running over 10 pounds will be rare. Since fishing pressure for bass is very heavy; and since they're quite vulnerable because of the narrow fringe of habitat they occupy in an artificial impoundment, any reduction in fishing pressure is important. Stripers also knock down shad populations and reduce the size of the individual shad by cropping off the larger ones. When young shad are in shallow water, the smaller sizes will allow young bass to take advantage of them. A study done by the Virginia Commission of Game and Inland Fisheries on Smith Mountain Reservoir showed that all of these benefits occurred after stripers were introduced in that reservoir."

Most of the big lakes in the Piedmont offer good striper fishing. The hotspots along the Virginia-North Carolina line are Kerr Reservoir, Lake Gaston and Roanoke Rapids Lake. The lakes on the Pee Dee and Yadkin river systems all offer good striper fishing, including Lakes High Rock, Tuckertown, Tillery, Mountain Island and Blewett Falls. Lake Norman also offers excellent striper fishing.

"We don't plan to stock stripers in any of our cold, mountain reservoirs because stripers are a warmwater fish," said Guier. "In cold lakes other predators such as salmon and walleyes serve the same purpose as stripers. Walleyes are also schooling predators and evolved in the Great Lakes and in other large lakes and rivers in the mid-west and northeast. These cold water species are much better suited to our mountain reservoirs."

In many of the smaller man-made reservoirs in North Carolina, the same problems of poor fish habitat and scanty cover apply. Here again, the striper is furnishing the answer to our problems.

"We're raising striped bass hybrids to use in many of our small city reservoirs," said Guier. "These city lakes have the same problems the big impoundments have except on a smaller scale. When they were built, the bottom was scraped clean, so the only good fish habitat is around the shoreline. The fishing pressure on bass and pickerel is extremely heavy since there's very little cover available. In the open water of some of these lakes, shad populations have boomed and nothing is feeding on them. In other lakes, small sunfish have become overabundant with the same results."

The hybrids being raised by the Commission are striped bass-white bass crosses. The fish are raised in hatcheries with the same methods used for fresh-water striped bass.

"The hybrids are similar to striped bass, but there are a couple differences," said Guier. "For one thing, they are more aggressive and strike a lure readily, which is characteristic of hybrids. They're also sterile, which doesn't really matter since this will be a "put, grow and take" fishery anyway. Their feeding habits are the same as fresh-water striped bass. They'll hunt the open water in schools, feeding primarily on shad."

The hybrids have a very rapid growth rate, and the average "good" fish in a small, city lake will probably run from three to six pounds. A "whopper" will run from 10-to-12 pounds. The average "good" largemouth bass caught in these waters is much smaller.

"Regular fresh-water striped bass grow too large for our small city lakes," said Guier. "We want people to catch a lot of good sized fish instead of a few very large ones. The hybrids will reach a good size and will offer plenty of sport and withstand a heavy harvest. This is very important since these lakes are very heavily fished. This will also relieve some of the pressure on the largemouth bass. The lakes getting striped bass hybrids will be under 1,100 acres."

Easy and cheap to raise, good to eat, fine fighters, adapted to man-made reservoirs, the striper is the fish made to order for the South.

The Quest For The Ideal Pond

A fish pond can be a source of immense pleasure. Unfortunately, it can also be a significant pain in the neck.

By Paul Koepke

A good, productive, warmwater farm pond of an acre or two can be an immensely satisfying thing, combining aesthetic gratification, resources for wildlife, recreation, and food for the table. To the casual observer, then, it might seem that the fortunate pond owner is one of the Lord's elect, with little to do but sit on a sunny bank, cane pole in hand, under slowly drifting, castled clouds, fishing and dreaming the happy hours away.

I wish in my heart that this was so, but in this real and earnest life of ours, as Longfellow observes, things are not what they seem. Every man-made farm pond has but one goal in life and that is to become a nice, soggy marsh when it grows up, and it bends its efforts to this end with the aid of all the natural forces available. The owner, on the other hand, is under constant pressure to remain alert and take whatever measures are necessary to maintain the *status quo*.

The most persistent agent of destruction is the water itself which is almost constantly in motion. Driven by the wind, it sends its waves — which range from ripples to occasional storm-driven white-caps — against the shore, nibbling and gnawing incessantly at the earthen banks which eventually crumble, creating shallows. Heavy rains impinging on any bare ground or dirt road in the drainage area will bring in streams of silt, producing even more shallow water.

The third menace to the pond's integrity is the unholy trinity of muskrats, livestock, and stray dogs. The muskrats are indefatigable burrowers and, quite aside from the threat they pose to the dam itself, are forever attempting to honeycomb the banks with passageways and underground chambers. The roofs of these, when softened by rain and trodden on by stock, will eventually cave in unless stray dogs find the burrow first and attempt to dig out the occupants. This produces even more shallows as well as some small inlets which wave action will eventually widen.

Unless vigilance is exercised, the net result of all this is a shoreline so rutted, uneven, and dangerous that it cannot be kept clear with a tractor-driven mower and shallow water so overrun with cattails, rushes, swamp roses, and various waterweeds as to make fishing difficult if not impossible. This shallow water growth is itself actually a quadruple problem, for in addition to frustrating the fisherman, it gives shelter to the very forage fish upon which the larger fish feed. Besides, these weeds, as they die and fall into the water, become essential building materials of a marsh and in so doing become the breeding ground for the filamentous algae which, if left unchecked, will eventually cover the entire surface of the pond, rendering it unsightly and useless.

It was into such a situation that we blundered in fatuous innocence when we decided, one cold February day, to buy a small piece of farm property with an acre pond. There was no indication to our unschooled eyes at the time that this thirty-year old body of water was going to pitch us any knuckle balls, and we drooled in anticipation of warmer weather and good fishing.

Spring, however, does not just come to the North Carolina Piedmont; it erupts. After a few warm days and some gentle rain, there was a touch of vibrant, tender green at our feet which gave little hint of the spate of foliage which soon came surging up around the pond in the following weeks. By May, we realized that we had a crisis situation. All those trifling little sticks, twigs, and canes which appeared so lifeless and barren in winter had magically come to life and in such profusion as to make it difficult to wet a line. Even worse, as the water warmed, the pond surface became dotted with large, floating islands of slimy, line-fouling algae. It was an attractive pond no longer and resembled nothing so much as an abandoned sewage disposal plant. In desperation, I called on the county soil and water conservation agent for assistance.

That worthy gentleman appeared in due time and stared sourly at me and the overgrown, festering mess spread before us. His name was Jester but he wasn't kidding.

"You gotta keep them edges clean — clean as a swimmin' pool!" he said in no uncertain terms.

He went on to explain that he had sited this pond and

Pointers On Ponds

Maintaining The Pond

Proper pond maintenance can be complicated, but it includes control of such factors as weeds and algae, water clarity and fertility. Weeds and algae can be controlled by careful applications of certain chemicals, while muddy water can be reduced by a variety of techniques, including sediment basins, bank cover, and controlled applications of certain chemicals. Proper fertilizers increase the growth of microscopic pond life and therefore contribute to improved growth and numbers of fish farther up the food chain. A balanced fish population can be partly controlled by proper harvest through sport fishing and, when necessary, seining. Your soil conservationist can offer assistance on pond maintenance, and fisheries biologists for the N.C. Wildlife Resources Commission can offer advice on a time available basis.

Stocking The Pond

A pond should be stocked with the right kinds and numbers of fish for the size of the pond you have in order to achieve the best fishing. Generally speaking, ponds of average natural fertility are stocked with 50 fingerling bass and 500 fingerling bluegills per surface acre. Redear sunfish (shellcrackers) may be substituted for one-third of the bluegills, and you may want to also stock channel catfish fingerlings in a bass-bluegill pond at a rate of 100 to 200 per surface acre. In most cases, do not be tempted to stock other fish, especially crappies. Your soil conservationist can offer assistance and even provide fish to stock under certain circumstances.

Selecting The Site

Many farms and suburban homes have suitable sites for ponds, and your local soil conservationist can assist you in selecting a suitable pond site. For best results, the pond should cover an acre or more, and it must have enough annual spring flow, well water, or silt-free runoff to replenish water lost by seepage and evaporation. The soil type is important since some soils will not hold water, and you should plan to have a depth of at least five feet in the deep end.

illustration by David Saholsky

Building The Pond

Ponds should have a dam with a top width of at least 10 feet, and there should be a shallow emergency spillway at one side of the dam. The drainpipe should be large enough to drain the pond in five to 10 days, and it should be equipped with an overflow device to maintain normal water levels and prevent erosion of the emergency spillway. The removal of trees and brush from the pond bottom prior to flooding will assist in seining which may occasionally be necessary. Avoid creating shallows, and try to plan for a minimum depth of no less than two to three feet in any portion of the pond. Good water quality is essential, and this includes understanding the effects of temperature, acidity, alkalinity, oxygen and clarity. Your soil conservationist can offer assistance on pond construction.

Duncan Heron

supervised its construction thirty years before and that it was one of the best in the county. It had been bulldozed out of the head of a ravine where the drainage area was adequate but not excessive, thus guaranteeing a full pond in times of normal rainfall and minimal danger of flooding in times of excess moisture. The soil type in the area is known as Appling-Cecil association — well-drained, gently sloping land of fine, sandy loam with a firm, red, clay bottom which reduces water loss from seepage. The earthen dam, Mr. Jester pointed out, was particularly well made, and I can testify to its strength and durability for, as a causeway, it serves to this day as the principal access to the property, supporting even a heavy, gravel-laden dump truck without a tremor.

The pond, then, was basically sound and well situated, but years of absentee ownership and neglect had taken their toll and there was nothing for it now but for us to get cracking. Bidding a rueful farewell to Mr. Jester, my wife and I proceeded to gird our loins and pitch in.

There was no question that clearing off the brush was going to be a manual job. A large portion of the bank and the dam face itself was terrain unsuitable for a tractor-mower, and herbicides were out of the question. Killing off the marginal vegetation would expose the banks to serious erosion and the herbicides themselves could be harmful to fish and other wildlife.

Tools were required, of course, and, in addition to rakes and potato forks, I acquired such a fearsome array of cutting implements — bush hooks, machetes, clippers, hatchets, axes, sickles, scythes, and saws — that my tool shed began to resemble an armorer's hut at the siege of Acre.

With the help of a couple of neighbor boys the great assault began. The most difficult portion was the one-hundred-and-fifty-foot dam face which sloped, sometimes precipitously, into ten feet of water. Since I do not swim, I did most of my cutting sitting down, only to learn that plumping oneself squarely on the stub of a newly-snipped blackberry cane can be a very moving experience. After a week of this hacking and schlepping, however, the marginal undergrowth had been removed and the water's edge at last made visible.

What was revealed gave us little comfort. Large clumps of rushes remained in the water together with beds of stately cattails and an abundance of willow limbs and branches all intermingled with decaying vegetable matter and rafts of green, filamentous algae.

Much has been made of Hercules' cleaning of the Augean stables by diverting two rivers through the area to flush out the residue, but we had no biddable streams at our command and had to rely on elbow grease and stoop labor. The rakes and potato forks were now brought into play and little by little, roots and all, the tenacious rushes and cattails were loosened and hauled ashore, and large gobs of malodorous, slimy gunk was sloshed onto the bank and ourselves so that by each day's end we looked like the sole survivors of an explosion in a spinach cannery.

Duncan Heron

There are an estimated 80,000 farm ponds in North Carolina, most of which were carved out by a bulldozer after a likely spot had been found. Good, sustained fishing requires careful management from year to year, and occasional seining is often necessary to maintain a properly balanced fish population.

Fortunately, there is an end even to cattails, rushes, and glop, and the day finally came when we raised our heads as far above hip-level as our backs would permit and saw that the edges were at last as clean as Mr. Jester's "swimmin' pool." With a sigh of relief we hung up our tools and turned our Charley horses out to pasture. There would be brush to cut several times each year, of course, but the pond would never again be allowed to fall into the wretched state in which we found it.

There is more to pond management than simply cutting brush, however. Most ponds do not have enough natural fertility to support the plankton and microscopic plants which are at the bottom of the food chain and which nurture the small aquatic animals consumed by fish. If three hundred to four hundred pounds of bass and bluegill are to be well fed, supplemental fertilizer (8-8-2 or 20-20-5) should be added until the water darkens to the point where a shiny object cannot be seen twelve inches below the surface. This greening usually takes a week or more. Another application is due when the object becomes visible at eighteen inches. This discoloration is caused by the millions of microorganisms themselves, not by the fertilizer, and it confers an additional benefit by cutting off the sunlight subaqueous weeds require for growth.

Water acidity is often a problem for pond owners and it is something we have had to cope with since we have sandy soil in our area which is deficient in calcium. Fish grow and reproduce well if the pH range lies between 6.5 and 9.0. Below pH 6.5, growth is slow and spawning is inhibited. At pH 4.0 and below, some fish may survive, but they will hardly thrive. This calls for occasional litmus testing and applications of agricultural limestone to bring the acidity within reasonable bounds.

Good fish pond management sometimes requires decisions on multiple use. After some years of allowing livestock access to our pond, I now view the practice with a jaundiced eye. A small herd of cattle will inevitably water at the nearest place with the gentlest slope, reducing it to a quagmire in no time. Horses and ponies, on the other hand, like to get into the pond on hot days and give themselves a shower by pawing violently with a front hoof. This sends up sprays of mud and water, roils the pond, disturbs the fish, and disgusts the fishermen.

Also, landscaping and farm ponds do not mix. The pond is intended to produce a crop and the idea of creating a poetic *mise en scene* by planting ornamental trees and shrubs around the edges and water lilies and colorful rushes in the water is utterly inane, as anyone who almost popped an iliacus cleaning out a pond will testify. Ideally, there should be no shrubs or trees within twenty or thirty feet of the water and no vegetation growing in it.

A farm pond owner will inevitably be contacted by the public for permission to fish. This is one of the thorniest problems he will face unless he adopts a firm policy at the outset and sticks with it. I was bubble-headed enough at first to grant permission to all who asked at no charge. As a result I was ripped off, littered on, and abused. Now I welcome only friends and reliable acquaintances but still at no charge, which leaves me in complete control and under no obligations whatsoever. But such selective and rather limited fishing means fairly light harvest of fish, which isn't always

Jim Dean

A string of bluegills heads for the frying pan, but owning your own pond provides benefits that go far beyond providing an occasional meal. Indeed, the therapeutic values of fishing are undoubtedly the most priceless gain, even though maintaining a pond is not always an easy task.

good. Actually one of the most persistent problems of many Piedmont and eastern North Carolina farm ponds is an overabundant population of bluegills which results in a "stunted" crop of these fish. It's been demonstrated that an acre of water can support just so many pounds of fish. These pounds can be wrapped up in thousands of very small fish, hundreds of medium-sized bluegills and bass, or dozens of catchable sized fish, or a "balance" of all these.

The "crop" of bluegills and bass should be harvested, thus making room for the new generations coming on. If the harvest isn't adequate, the food supply (which is pretty well fixed) simply isn't enough to go around; somebody is bound to go hungry. And much to the fishes' own detriment, they seldom starve to death; they simply quit growing when food is in short supply. Spawning continues — the fish are mature, only small — and the problem escalates until it gets out of hand. Then even heavy fishing fails to correct the population problem, and drastic steps of "population eradication" (which should be undertaken only by a qualified fish biologist) may be in order.

For the benefit of those who see a pond in their future, there are several things you should know. Several government agencies can offer advice or services which can be of immeasurable assistance.

The U.S. Soil Conservation Service, through your local soil and water conservation agent, can offer excellent advice and certain types of assistance should you want to construct a pond. Also, you may want to obtain the U.S. Department of Agriculture Farmers' Bulletin No. 2210 on pond construction, and Farmer's Bulletin No. 2250 on warm water fishponds. These are available through the U.S. Soil Conservation Service.

Your county agent can also help you when it comes time to stock your pond. S.C.S. will provide fingerling fish free (from the U.S. Fish and Wildlife Service) at the rate of 500 bluegills and redear sunfish and 50 largemouth bass per acre. You can also buy fish from commercial growers, but don't do both.

The North Carolina Wildlife Resources Commission has no authority to provide either construction or stocking assistance to pond owners, but the Commission's fisheries biologists are able to offer advice on farm pond management. You must make written application through the Divison of Inland Fisheries, 512 N. Salisbury Street, Raleigh, N.C. 27611; and upon receipt and approval, a biologist will call, and perhaps even visit the pond to discuss any problems. Such consultation, however, is on a time available basis since fisheries biologists have primary duties on public waters.

You may want to order — from the above address — the Wildlife Commission's informative booklet on "Pond Management," which discusses common pond problems and corrective measures.

By now, your earlier vision of a self-sustaining pond and countless days of lazy angling may have been dispelled, but do not despair. Indeed, it does take work to keep a pond and its inhabitants healthy, but the rewards must at least balance the problems. Why else would there be 80,000 ponds in the State?

Paul Koepke is a frequent contributor to this magazine, and is professor of music theory at N.C. Central University. He lives in Durham.

Roots, Bark & Lots Of Bed Rest

Many of North Carolina's native plants have positive medicinal benefits for what ails you.

By Peggy Payne

Got a bad bruise. Maybe you need a little witch hazel.

You probably don't realize it, but many of the medicines you routinely take for various discomforts and ailments are derived from an almost countless array of medicinal plants which grow in North Carolina.

Indeed, such items as witch hazel leaves and wild cherry berries are merchandise for some businesses in the State, including the Wilcox Drug Company — a fourth-generation outfit in Boone.

Roots and leaves, gathered by free-lance collectors, are brought by the sackload here to be cleaned and packed and shipped and sold.

Wilcox Drug Company buys the parts of about 100 kinds of plants. They are sold for use in foods and pharmaceuticals, and in herbal teas. They are a raw material of the health food industry.

North Carolina has always been one of the leading states in the growing of the plants used in commercial drugs, according to a North Carolina State University botany professor, Dr. James Hardin.

Kenneth Wilcox's great-grandfather was in the "botanical" business back about 1875. His grandfather founded this firm just as the century turned.

Each year since then the season has begun in the warming of the spring. In March at Wilcox, a little cherry bark was coming in. In early June, there's a little May apple, maybe a little lady's-slipper. Then the season of plant medicines is in full bloom. In June and July, collectors, the veterans and the younger ones of the "back to earth" movement, stack their gatherings in the warehouse for weighing and checking.

Bloodroot (Sanguinaria canadensis), shown on the preceding page, is a fairly common plant in this State, and it contains strong alkaloids which are used in the manufacture of certain pharmaceutical preparations. As a folk remedy, bloodroot has been used to treat ringworm and warts. Its roots exude a red sap when broken or bruised, thus the common name of bloodroot. Witch hazel (Hamamelis virginica), above, may flower as late as November after other trees are bare. Its leaves and branches are distilled to make an astringent and mildly antiseptic extract.

The yellow lady slipper (Cyprepedium species), upper left opposite, is rare and protected in many areas, yet it has been used to make a sedative or "nerve" tonic. Balm of Gilead (Populus balsamifera), lower left opposite, is gathered by mountain folks for use in salves or linaments. Black cohosh (Cimicifuga racemosa), right opposite, has been used as an old time remedy for respiratory afflictions and coughs, and drug companies still purchase the root from which they use certain extracts.

As with all medicinal plants, only experts should attempt to use any plants to produce "home remedies."

What comes in here from the woods may go off to a processing plant and come back to the state in another form. Behind the prescription counter of a Kerr Drug Store in Raleigh, Mike Johnson explained how something in May apple finally becomes wart medicine. What that something is is podophyllin. It comes in a powder; dermatologists order it in prescription.

In addition to the commercial use of plants, there are the ongoing traditional medical uses of plants by blacks, Indians, and to a lesser degree white populations in the state.

North Carolina has been one of the leading producers of these plants, according to botany professor Dr. James Hardin, because the flora here is very rich. Hardin wrote *Commercial Herbs, Roots and Pollens of North Carolina*. There are about 3400 species of vascular plants. "That's as rich as any other state in the East." The state, with mountains and coastline, offers a wide diversity of terrain for growing different kinds of plants.

Early settlers who came here from Europe were accustomed to using medicinal plants. Early European botanists traveled through the state, identifying the plants here that could be used. Andre Michaux, a botanist of the late 1700's, showed people in the Southern Appalachians how to find and gather and dry some of the wild medicinal plants.

Now, the market for plants for commercial drugs is not what it was. "Generally business has decreased in the last 20 years," Hardin said. "About 20 years ago, there were probably six or eight companies in the state that bought the leaves or roots from pickers. Now there are only two or three."

The reason the industry for botanicals, or plant-based drugs, has decreased, Hardin said, is that fewer drugs are employing these natural ingredients. More synthetics are being used. But, generally, the plants are still here, and they are still gathered.

Stargrass root is one of the plants that is used for rheumatism. It's used to treat sore muscles, and it's taken as a sedative. It's still in use in parts of Eastern North Carolina for "a broad range of things," Hardin said. The plant grows to three feet tall, an herb with grasslike leaves and white or cream-colored flowers. The rootstock, the collectable part of the plant, is greyish-yellow and covered with wiry roots. The roots of stargrass are boiled to produce a tea and drunk.

Other Reading

Morton, Julia F. 1974. FOLK REMEDIES OF THE LOW COUNTRY. E.A. Seeman Pub. Inc., Miami, Florida. (useful for Coastal Plain)

Morton. 1977. MAJOR MEDICINAL PLANTS: BOTANY, CULTURE, AND USES. Charles C. Thomas, Publisher, Springfield, Illinois.

Weiner, M.A. 1972. EARTH MEDICINE — EARTH FOODS. Collier Books, New York.

Hardin, James W. COMMERCIAL HERBS, ROOTS AND POLLENS OF NORTH CAROLINA. 1975. Agricultural Experiment Station Bulletin 435. Raleigh.

Mayapple. (Podophyllum peltatum) can also be toxic, but pharmaceutical companies use its root for several purposes, including wart removal remedies.

The bark of the root of the commonly-cultivated cotton plant is also boiled to produce a medicine. The bark is collected before the first frost in the fall. It deteriorates with age, so only recently gathered bark is used. What it's used for has included both diarrhea and dysentry. "One of the interesting things about this folk medicine," Hardin said, "are the different uses for the same plant."

White pine is an easy pine to identify. It has very smooth twigs and five needles in a cluster. It's cultivated throughout the State and occurs naturally in the mountains and the western Piedmont. The inner bark is used in cough medicine. It works as an expectorant in cough syrup. It is supposed to reduce swollen membranes in the mouth and throat.

Goldenseal is used as an overall tonic which heavy demand has somewhat depleted. Its uses have been, ginseng-style, for "everything that's wrong with you."

Witch-hazel bark is used for treating bruises and sprains and it's made into a shaving lotion.

Yellow jessamine root is a twining woody vine with bright yellow flowers that bloom January to April. It's found in thickets and on roadsides and streambanks in the Coastal Plain and lower Piedmont. Ed Croom, another NCSU researcher on the subject, interviewed a man who uses it for yellow jaundice. It has also been used as a central nervous system depressant, and an anti-spasmodic.

Gatherers of bayberry root make a tea of the root bark to treat stomach ulcers. Balm buds, terminal poplar buds, are used in healing wounds.

There's varying clinical evidence for the effectiveness of traditional plant cures. Some of it is pretty sound. "People still use willow bark to treat a fever," Croom pointed out. The plant is the original source of salicin, from which aspirin was first derived.

There's another sort of argument for the effectiveness of some of the plant drugs. "A Lumbee showed me a rheumatism plant that he would bathe with," Croom said. He found that it was a species of club moss that is used in China for rheumatism. "That's a pretty amazing coincidence."

John Lee and his wife Hattie Lee rely on medicinal plants for a lot of their doctoring. They live at the end of a dead-end road in the country near Moncure. Sixty-eight year old Lee was rebuilding a fence when I visited. He came up the hill to the house to talk about medicinal plants.

He learned to use the plants from his mother who was a midwife. She showed him how to find them in the woods when he went with her to deliver babies. Since then the Lees have had 14 children of their own. They have used their plant remedies for themselves and the kids. But they have gone to a doctor with the broken arms and the ear infections, he added.

Still, it has probably been 25 years since he went to a doctor himself, he guessed. More recently he has used his sarsaparilla and his pinetop tea. Gall-of-earth is good if your blood needs purifying, he said. Nightshade, its leave mashed and mixed with milk, is a good lotion for poison ivy.

But some of the plants themselves are poison. And the unknowledgeable can get into bad trouble. "They can kill themselves." It's easy to get the wrong herb, he said. And when you do, it's difficult to tell a doctor what it is you have eaten.

Still, with his years of familiarity, he trusts these drugs. Last time he went to New York to visit some of his children, he took seven or eight pounds of sarsaparilla and some other plants they had asked him to bring. "Some of them were looking kind of poorly when I got there," he said.

On the morning we talked, I had a cold. John Lee offered me a little something to help it. It came from a jar, filled with dark chopped plant roots, labeled "100 Proof Georgia Moon Kentucky Straight Corn Whiskey."

He poured a slosh of the brown liquid shot-deep into the bottom of a plastic cup. "Don't take it too fast," he cautioned. It was a rib-rattler of a sip of medicine. The label was not left over from earlier contents of the jar. The tangle of chopped roots had been steeping a few days in straight corn whiskey. Temporarily at least, I felt a lot better.

Peggy Payne is a free-lance travel writer from Raleigh, and a frequent contributor to this magazine.

Letters

Dear Sir:

I read your article, "A Future for Black Bears?" in WILDLIFE IN NORTH CAROLINA with great interest, as I've been researching a possible children's book on this animal. I wasn't familiar with the real-life bear, "Old Reel Foot" on which Faulkner based his famous story and would like to find out more about him. Could you give me more information on Old Times in the Faulkner Country by Jonathan Cullen? If I could get hold of this, it sounds like a good source of information about Old Reel Foot. Or if this is hard to find (being out of print, possibly?) perhaps you could suggest another source or two for this information.

What I would do with this information is include it in a historical chapter on black bears, should I do the book.

I'm a subscriber to WILDLIFE IN NORTH CAROLINA, incidentally, and enjoy it very much.

Barbara Ford
Mendham, New Jersey

"Old Times in the Faulkner Country" by John Cullen, was reprinted by the University of North Carolina Press, Chapel Hill, NC, about 1962, and may be available in public libraries, or from the UNC Press.

"Bear, Man and God, Seven Approaches to William Faulkner's "The Bear' " is edited by Francis Lee Utley and others, and contains additional references to the bear.

Dear Sir:

I enjoy your magazine very much and I have a suggestion for a series of articles. I'm sure that many of your readers would like to read an informative article on each of our North Carolina game lands.

I've been very disappointed to reach a "game land" only to find it all but inaccessible. The maps in the map book aren't really very informative about canals I can't cross, dense underbrush, and little known game laws. For example, two years ago I was cited for hunting waterfowl on an "off day." This was published in a booklet that I did not receive with my game lands license. A series of articles on each of the many wonderful game lands would be helpful to many sportsmen.

Alton Turner
Eure

Dear Sir:

I think that I have been around long enough to be classified as "an old timer," and I have hunted and fished in North Carolina for over 35 years. Like a lot of other sportsmen, I've seen some good years and some that weren't so good. Of course, my memory isn't much better than most anybody elses', but I think that the fishing in areas where I fish is probably better now than it was 30 years ago. I'm really not much of a consistent hunter, but my luck has been just as good the last few years as it was in the "good old days."

The real point of my letter is to express a real concern for the wildlife program and its future. I have read some things in the paper over the last week or so that sort of worry me. It sounds like some of the things that the Wildlife Commission has been doing to make hunting and fishing better, may not be around much longer because of money problems. It would be a big loss if these projects (and the wildlife) go down the drain.

Herbert Masters
Greensboro

Dear Sir:

I'm returning your waterfowl questionnaire and I have a question about the ducks in our area. If you have information as to where the ducks were this past season I would be very much interested.

R.L. Dean
Charlotte

We appreciate your reply to the North Carolina waterfowl questionnaire. In reference to your question as to where the ducks were this past season, due to mild winter weather, the ducks did not migrate south until late January and February. The few that did come down stayed in large flocks in large open water areas. A flock of about 60,000 scaup stayed in Neuse and Pamlico sounds, but unlike last year they did not break up and come inland.

The waterfowl hunters in North Carolina, South Carolina and Virginia experienced one of the lowest duck harvests of recent years while some of the New England states had some of their best.

Grady L. Barnes
Assistant Chief
Division of Game

Dear Sir:

Some of us like to keep our "shooting eye" sharp, and enjoy crow hunting in the off-season. Lots of North Carolina hunters probably don't realize that the hunting season on crows is September 25 – November 25, and then April 30 – June 30. It might save some of them some trouble if you would print this information.

Jack E. Maybry
Raleigh

Dear Sir:

Last year I attended the Conservation Summit presented by the National Wildlife Federation near Black Mountain, N.C. It may be too late to tell your readers about it, but I certainly recommend it highly. The information that I have is that it is June 23 – June 29 this year. Those interested can get full information by writing National Wildlife Federation, 1412 16th Street, NW, Washington, D.C. 20036.

Ralph W. Parsons
Asheville

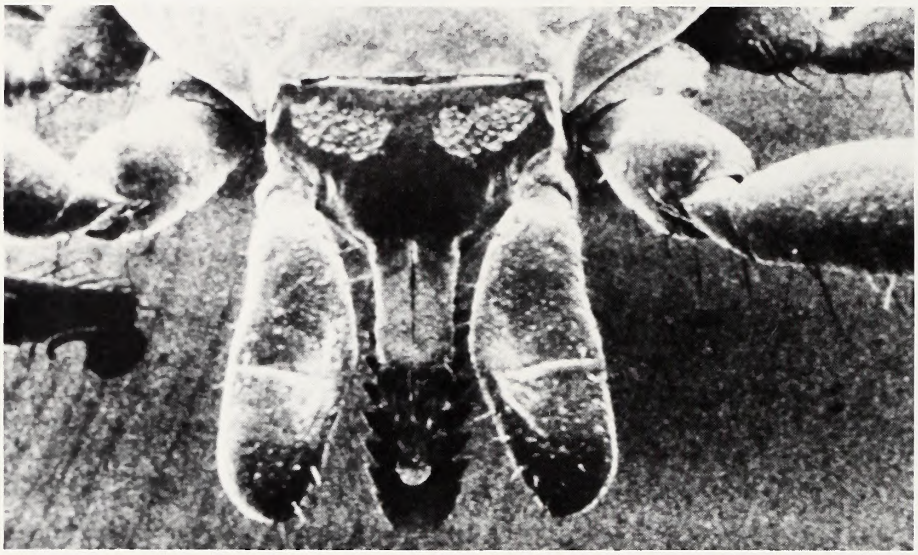
Dear Sir:

I am 12 years old and the first day of turkey season this past spring, my brother and I walked down a dirt road towards a river. Every hundred yards we would stop and listen. It wasn't long before we heard a turkey gobble about a hundred yards away. We called, but the turkey would not answer. About an hour later, a crow came over cawing and we heard the turkey again gobble. My brother told me to try to go around him, but I guess the bird heard me.

Later that morning, I heard it gobble again; it was going away from us. After lunch, I went down the same dirt road and sat down about where I heard him last. About 15 minutes later, I heard something moving through the brush. I saw two turkey heads moving through the grass. The first one started moving away from me. So I called. The second one turned around and I saw a small beard, so I shot twice and had my first turkey. He weighed about 15 pounds.

Patrick Cummings
Charlotte

Tips For Preventing Rocky Mountain Spotted Fever



Fisherman are prime candidates for Rocky Mountain Spotted Fever, which is carred by American dog ticks found mostly in the Piedmont.

When ticks become fastened, they are sometimes hard to remove. Shown above are the mouthparts of a tick.

NORTH CAROLINA HAS more cases of Rocky Mountain Spotted Fever, and deaths from this disease, than any other state. That's why those who plan to spend time outdoors this summer should be careful to avoid ticks.

"Almost all our cases of Rocky Mountain Spotted Fever come from the Piedmont," said Dr. Charles Apperson, medical entomologist with the N.C. State University Extension office. "Only the American dog tick carries the virus, and people can contract the disease only through the bite of an infected tick."

North Carolina had 204 reported cases of Rocky Mountain Spotted Fever in 1978, and six of the cases resulted in deaths. Children from age 4 to 15 are most affected because of the amount of time they spend outdoors in the summer when ticks are most prevalent. The disease, however, is most dangerous to people over 40 years old. Entomologists estimate that five percent of the dog tick population carries the disease.

Symptoms of the disease appear within two to 14 days following the bite. They start with a headache, fever, chills and aches and pains. A rash often breaks out around the wrists and ankles. If the disease is not treated, the fatality rate runs about 17 percent and many of the survivors may die years later from body organ damage caused by the disease. If the disease is caught early, the mortality rate still runs about five percent.

"The first thing people should do if they find a tick on them is to remove it," said Apperson. "Fortunately, the tick has to be attached for six hours to be able to transmit the fever to a human being. After removing the tick, mark the calendar on the day the bite occurred. If any of the symptoms of the fever appear within two to 14 days following the bite — chills, headache, rash, fever, or aches and pains — seek treatment immediately."

The American dog tick can be distinguished from the Lone Star tick and the black-legged tick, neither of which carry the disease. The Lone Star tick has a distinctive white spot in the center of its back and the black-legged tick has an orange-brown body and dark black legs; however, the dog tick is brown with a whitish patch, so take no chances with any ticks which get on you.

"The best way to deal with Rocky Mountain Spotted Fever is to prevent it," said Apperson. "There are several steps a person can take. The first is to check your body two to three times a day if you're outdoors so that, if an infected tick has bitten you, it will not have had the six hours it needs to transmit the fever. Look over your arms, legs, groin area and hair for ticks. If you find one, simply grasp the tick firmly and slowly pull it out. If the mouthparts break off in the wound, dig them out with a sterilized needle. The mouthparts can't transmit the disease but can cause an infection. Common insect repellents also work against ticks. Since ticks tend to crawl upwards, it's a good idea to tuck your clothes in and eliminate bare skin where they can clamp on. A lot of ticks are also carried into the home by pets so check your pet for these insects regularly. A flea-tick collar will help reduce the numbers of ticks pets bring in."

When removing a tick, it's important to use tweezers or a paper towel while holding the tick. An engorged tick can transmit the disease through even minute breaks in the skin. There is no effective vaccine for Rocky Mountain Spotted Fever, and the vaccine used in the past has been taken off the market.

Barbara Whaley, program specialist for the Rocky Mountain Spotted Fever project, is also working to reduce the incidence of Rocky Mountain Spotted Fever.

"The key to reducing spotted fever cases is education," she said. "We've designed four programs on ticks and spotted fever for all age groups. These tell how the fever is transmitted and how to guard against it."

Anyone wanting more information on Rocky Mountain Spotted Fever should contact the Rocky Mountain Spotted Fever Project, Extension Entomology, Box 5215, Raleigh, N.C. 27650, or call 1-800-662-7301 and ask for tape numbers 2712, 2713, and 2714.

Duane Raver Retires As Editor of WILDLIFE

DUANE RAVER, JR. is one of the nation's most recognizable names in the field of wildlife art; and for nearly 20 years, he has also been the primary reason for the very existence of WILDLIFE IN NORTH CAROLINA.

Beginning in July, Duane will retire as editor of this magazine to pursue a career as a full-time free-lance wildlife artist. Duane's association with the North Carolina Wildlife Resources Commission goes all the way back to 1950 when he was first hired as a fisheries biologist, a position he held until 1960 when he became Managing Editor of WILDLIFE. In 1973, he was named Editor, but those of us who have worked with him over the years know that this hardly tells the whole story.

Indeed, for many years, Duane virtually put this magazine together from start to finish single-handedly, and it is a tribute to his success that WILDLIFE has attracted a growing following over the years until it is now considered one of the top state wildlife publications in the country.

"A few months after I came on the job back in February of 1950," Duane recalls, "I was issued a 14-foot boat, an old 10-horse Mercury, a couple of seines, and a crew of three college kids. Harry Cornell, who was then chief of the Fish Division, told me I had three months to survey 14 lakes with my crew.

"Fortunately, since I was less than a year out of college, I knew just about everything there was to know about fishery biology and lake investigations," he says kiddingly. "My crew was the only thing I wasn't too sure of. There was a big, blond boy in jeans and sneakers who looked like he just got off a surf board; a dark, quiet kid who kept looking things up in a fish book he carried; and a skinny, studious youngster who I knew could never hold down his end of a big seine.

"I guess I must have done something right though," says Duane. "Frank Richardson (the blond) is now assistant regional director with the U.S. Fish and Wildlife Service in Atlanta; Don Baker (the quiet kid) is now chief of the N.C. Wildlife Resources Commission's Division of Inland Fisheries; and Gene Hester (the skinny kid) is associate director of Environment and Research for the Fish and Wildlife Service in Washington, D.C."

Despite his modesty, Duane hasn't done too badly either. In addition to editing this publication, he has been drawing fish and game birds since 1951, and completed well over 100 front cover paintings for state wildlife magazines, including this one. He has illustrated fish books for North Carolina, Virginia, Oklahoma, Louisiana and drawn a series of 41 fish for the U.S. Fish and Wildlife Service. His fine paintings are hanging in countless homes across the nation, and he has won many awards, including the N.C. Wildlife Federation's Wildlife Artist of the Year in 1972, 1975 and 1976.

He has lost track of just how many paintings he has made over the years, but he certainly has no plans to quit painting.

"I'm anxious to get into illustrating and painting full-time, and wildlife will continue to be a big part of my life," says Duane. "The Wildlife Commission has been much better to me than I've been to the Commission, and I've been associated with many, many great folks. I only wish that I had taken time to know more of them in a closer way."

Duane, who is a native of Newton, Iowa and a 1949 graduate of Iowa State College, lives with his wife, Mary, and family in Cary. His daughter, Diane, is a practicing taxidermist, and a second daughter, Jean, is assistant manager of a Raleigh jewelry shop. His son, Dick, is in senior accounting at Hardbargers Business College.

No doubt about it, we'll all miss Duane up here, and nobody is looking forward to that first deadline when we'll need his help and he'll be out there somewhere painting another super fish or quail. But we hope — like many of you — that we'll still be able to get our hands on some of those paintings from time to time so we can show them to you in WILDLIFE IN NORTH CAROLINA.

Smoky Mt. Workshops

A SERIES OF FIVE-DAY workshops on outdoor and environmental subjects will be held at the Great Smoky Mountains National Park this summer in a cooperative program between the Park and the University of Tennessee.

Seventeen topics ranging from birds and photography to recreational and environmental problems affecting a national park will be covered by a staff of instructors from the Park and University.

Workshops will be held Monday through Friday, June 18 through September 7, for a total of ten weeks. Instruction will include classroom activities as well as field trips.

The registration fee will be $75 per student per workshop. Students will be required to furnish their own room and board, but camping fees will be waived for those who wish to stay in a Park campground while the workshops are being held.

For more information, contact the Great Smoky Mountains National Park, Gatlinburg, Tennessee 37738 or the University of Tennessee, Noncredit Programs, 2016 Lake Avenue, Knoxville, Tennessee 37914.

January Enforcement Report

FOR THE MONTH OF JANUARY, 1979, the N.C. Wildlife Resources Commission checked a total of 7,551 hunters and fishermen and 126 boaters.

Of the hunters and fishermen checked, 662 were prosecuted and 562 convictions were obtained. The total fines collected were $14,861 and the total costs collected were $12,892.

Of the boaters checked, 96 prosecutions were made and 73 convictions were obtained. Total fines collected were $195 and total costs collected were $1,589.

Other prosecutions totaled 19 and convictions totaled 16. Total fines collected were $335 and total costs collected were $270.

All fines, and any arrests or witness fees, were paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected were paid to the N.C. Wildlife Resources Commission or its personnel.

N.C. Wildlife On The Air

FANS OF "WILDLIFE IN NORTH CAROLINA" might want to listen in on the Commission's new radio programs. The programs, entitled "Wildlife In Eastern North Carolina," "Wildlife In Piedmont North Carolina," and "Wildlife in Western North Carolina" are being carried by over 80 radio stations throughout the State.

Hosts of the programs are Tim Hergenrader, Rick Estes and Curtis Wooten, each of whom are information and education representatives for the three regions of the State.

The programs last five minutes and are produced once a week. Topics cover hunting and fishing tips, Commission wildlife programs, environmental issues and interviews with Commission personnel and others on various outdoor subjects.

To find out when the shows are aired, contact the radio stations in your area.

Black Mt. Is Conservation Summit Site

THE NATIONAL WILDLIFE FEDERATION will be holding one of three annual conservation summits in the Blue Ridge Mountains of North Carolina. The North Carolina summit will be held at the Blue Ridge Assembly, a YMCA conference center near Black Mountain, from June 23 through June 29. The summit offers interesting courses in dozens of subjects ranging from bird study to camp cooking and conservation. It is staffed by experts, and the sessions combine learning with enjoyable field trips and recreation.

The two other summits will be held in the Rocky Mountains and the Adirondack Mountains. For more information on the summit programs, write to the National Wildlife Federation, 1412 16th Street N.W., Washington, D.C. 20036.

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Nature's Ways Bogs Of The High Country

written and illustrated by Duane Raver

Wetlands come in a wide variety of forms: swamps, marshes, bays and bogs. Each has its own set of characteristics, but they all have at least one thing in common — standing water of some sort at various times of the year. And all have their peculiar niche in nature's scheme of things. The importance of water can't be overstated; it keeps all living things going. Each bit of fresh water plays a vital role in providing life's necessities to hundreds of species from simple, one-celled plants and animals to the largest of our game species. Wetlands are truly "liquid assets."

One of these moist land areas is the mountain bog — the wetlands of the high country. Several occur above the 2,500 foot level in our mountains, some are scattered through the foothills from Surry to Henderson counties. Although by no means all of these contain the rare bog turtle, it is this disappearing reptile that perhaps has focused attention on the dwindling upland bog.

The normal sequence of events in the life span of this type of habitat is a gradual change from a small valley to an alder-filled puddle, to a weedy, soggy meadow full of mixed shrubs and trees. Nature doesn't let much of anything remain the same for very long and left alone, the mountain bog slowly loses its identity and along with it, its special inhabitants.

Several of these unique areas have been under study for some time, particularly with special reference to the status of the bog turtle. Mountain bogs range in size from 30 feet from end to end, to over a dozen acres in extent. They certainly aren't very imposing, and most of us might slosh right through them and still not realize where we were. We would sink to a depth of six or eight inches in soft, mucky mud, which might be topped by a mat of sphagnum moss and perhaps three or four inches of water over this. Hummocks of sedges and other aquatic grasses form little islands here and there, with willows and alders in patches along the edges in no particular pattern. Aquatic and moisture-loving plants flourish from a few feet up the grassy banks to well out in the standing water. Much of this vegetation blooms during the spring and summer, providing a special beauty for the bog. The abundance of this plant material — undergoing the normal cycle of growth, flowering and death — creates the decaying mats characteristic of the bog.

Burrowed in these layers of decomposing vegetation are aquatic insects and developing larvae. Dragonflies, damselflies, midges, mosquitoes and their relatives, flit above the surface of the bog waters during the summer months. Harmless water snakes occasionally wander through the watery bog, hunting frogs and other tidbits the habitat provides. Fish are generally not abundant here, and usually aren't present at all. Warm, windless summers often deplete the oxygen supply for fish, and the cold, ice-covered winters, may freeze them out.

To find the mountain bogs, perhaps you'd better look quickly. Many are gone — drained, plowed, or scratched out of existence. Others are in the paths of progress . . . superhighways, developments, advancing "civilization." And once they are gone, we will be poorer for their loss. With them, will go a host of wild things, and we will miss them.

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WILDLIFE IN NORTH CAROLINA

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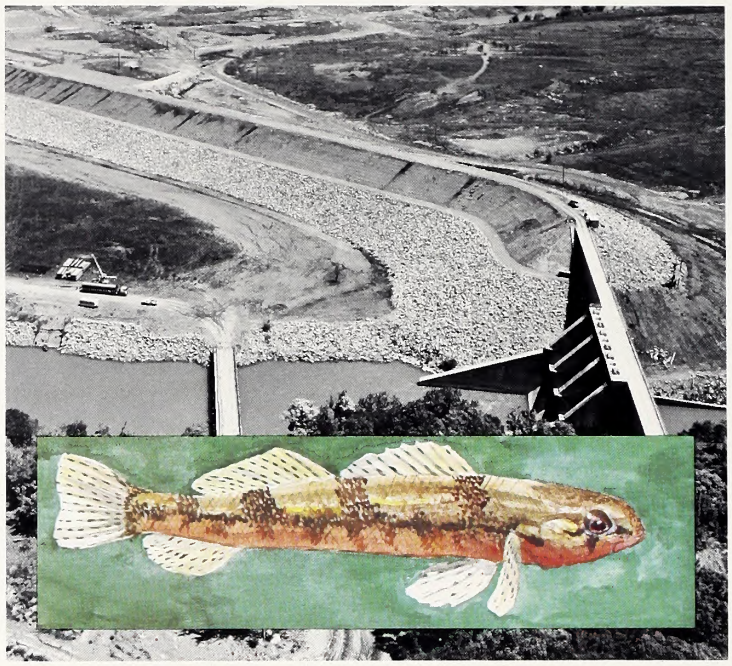
Our Natural Heritage *Don't Blame The Snail Darter*

by Jim Dean



A tiny endangered species of fish called the snail darter has gotten all the credit for the recent defeat of the Tennessee Valley Authority's $120 million Tellico Dam Project on the Little Tennessee River. The real story behind this incredible boondoggle, however, is much more complex.

The apparent absurdity of the conflict between a huge dam and a three-inch fish has been basic fodder for broadcasters and editorialists ever since ichthyologist, Dr. David Etnier, discovered the snail darter in 1973.

"How in the world can we be so stupid as to let a tiny fish with no value to anyone stand in the way of progress?" That was the standard logic expressed by TVA, and it was echoed far and wide by the press as though it were the only obvious and sane reaction. Indeed, with few exceptions, North Carolinians clucked their tongues and supported the completion of the dam. Few, including many normally suspicious editors, bothered to dig into the controversy to learn the whole story.

Even now, with the defeat of the Tellico Project at the hands of the U.S. Supreme Court and the Cabinet-level Endangered Species Committee (which unanimously refused to exempt the project from the Endangered Species Act), many people still consider the snail darter as the villain.

To be sure, the snail darter deserves credit for its key role in the defeat of the Tellico Dam, but Interior Secretary, Cecil D. Andrus, made it clear that other problems existed when he remarked that he "hated to see the snail darter get credit for stopping a project that was ill-conceived and uneconomic in the first place."

Perhaps more than anything else, the controversy over the snail darter brought to light an incredible story of poor planning, misrepresentation and outright arrogance. Volumes could be written about the conflict, and there is not room here to go into much detail; however, you may find the following items interesting.

— TVA rushed the dam to near completion following discovery of the snail darter, spending an additional $50 million while in full knowledge that the project would be in violation of the Endangered Species Act. TVA also claimed that much of the $120 million spent on the project would be irretrievably lost if the lake could not be filled when, in fact, the actual cost of the dam was only about 10 percent of the total project. Much of the budget was spent to buy fertile farmlands and improve roads and bridges — all recoverable.

— TVA claimed project benefits in recreation, development, electric power production and flood control, placing the greatest emphasis on recreation. Yet, the General Accounting Office report found these benefit claims to be completely unreliable, noting that there are already 24 reservoirs within 60 miles and that the project would destroy the finest river trout fishery east of the Mississippi. GAO found that the dam would have no power generators, and would only assist in producing a scant $3 million in electricity annually through water diverted to another generating unit. By not building the dam, however, the agricultural benefits could reach as high as $24 million annually. Flood control, irrigation, navigation and power benefits were negligible for the Tellico Dam project which was the last of TVA's 61-dam network in the valley.

— TVA refused to consider alternatives to the dam despite public pressure, including a request from Tennessee's Governor Winfield Dunn to adopt a river plan instead of completing the Tellico Dam. Such losses as more than 16,000 acres of prime agricultural land, and 200 historical sites (including Tenasi, sacred Capitol of the Cherokee Nation from whence the State derives its name, two colonial forts and the nation's oldest prehistoric sites of continuous human occupation) were virtually ignored. Present and projected recreational use of the river for float trips, canoeing and its outstanding trout fishing were also not adequately considered.

— Of the entire 38,000 acres in the Tellico Project, TVA purchased 18,870 acres more than required for the project at low, condemnation prices, with plans to resell the surplus land for development at much higher prices.

— As late as August, 1978, a government safety study found the Tellico Dam spillways inadequate and projected that bringing the spillways into compliance would cost an additional $22 million to $51 million depending upon the ultimate use of the structure. Not even TVA's carefully contrived cost benefits could offset this overage.

These are but a few of the more interesting problems which were revealed through the lawsuits and government investigations generated as a result of the controversy over the snail darter to say nothing of the validity of saving endangered species. Still, it is abundantly clear that the Tellico Dam project was largely a "snow job" in terms of real benefits, and it took many years and a landmark court decision to finally slice through the baloney and learn the truth.

You can say what you want about the snail darter. You can even call it "God's pebble for David's sling," as did Jim Bailey, a 30-year veteran of Tennessee's Department of Convervation. But one thing is clear. Even if the snail darters should suddenly disappear from the face of the earth tomorrow, they will have served an admirable purpose.

WILDLIFE IN NORTH CAROLINA

"Wildlife in North Carolina" is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

July, 1979

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15 Can You Top These Records?
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Nature's Ways *Written and Illustrated by Duane Raver*

Cover *"Pamlico Storm" By Bob Dance*
"The boat is a classic, small Harkers Island design that I found in Beaufort. If you could see the bow, it would have the curved flare that is so characteristic of these boats. Amazingly, the boats are built without plans. Certain objects have the right look; the Winchester lever-actions, the Colt Peacemakers, the Beechcraft Staggerwing airplanes. These boats have that look. Form follows function. This was my first painting in the new Alkyd medium. I like the medium because it dries faster than oil and can be glazed at frequent intervals. I often use 20 to 30 glazes in order to get the illusion of depth."

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Where Trees Don't Grow

Why do some of our mountains have bald spots? It's a puzzling, but attractive mystery.

by Peggy Payne

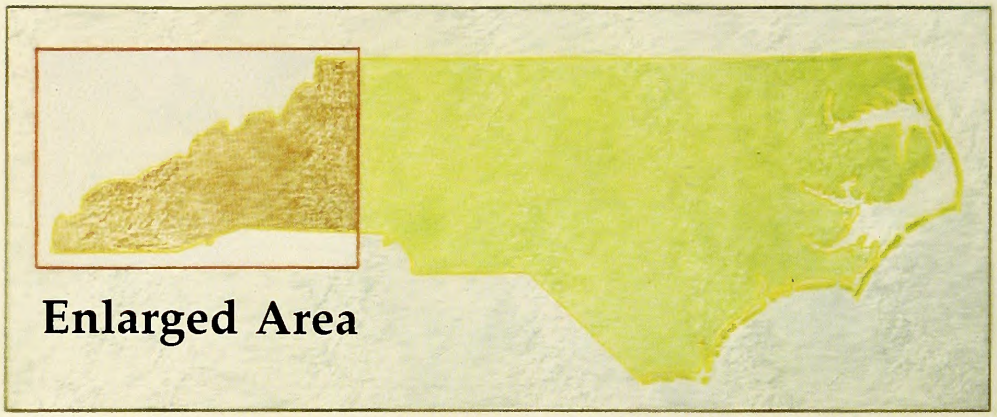
On the broad, treeless top of the mountain, the wind was rumpling the mountain oat grass. A few rocks, scattered clumps of rhododendron and bordering trees slowed the breeze a little; but on the open crest of the mountain, a sign was the tallest thing around.

The sign said Round Bald. It wasn't necessary. Whatever its proper name, anyone crossing this mountain would know that it's round and bald.

The one rock outcrop big enough to stand up to the smooth horizon was a landmark; it drew almost every hiker that passed.

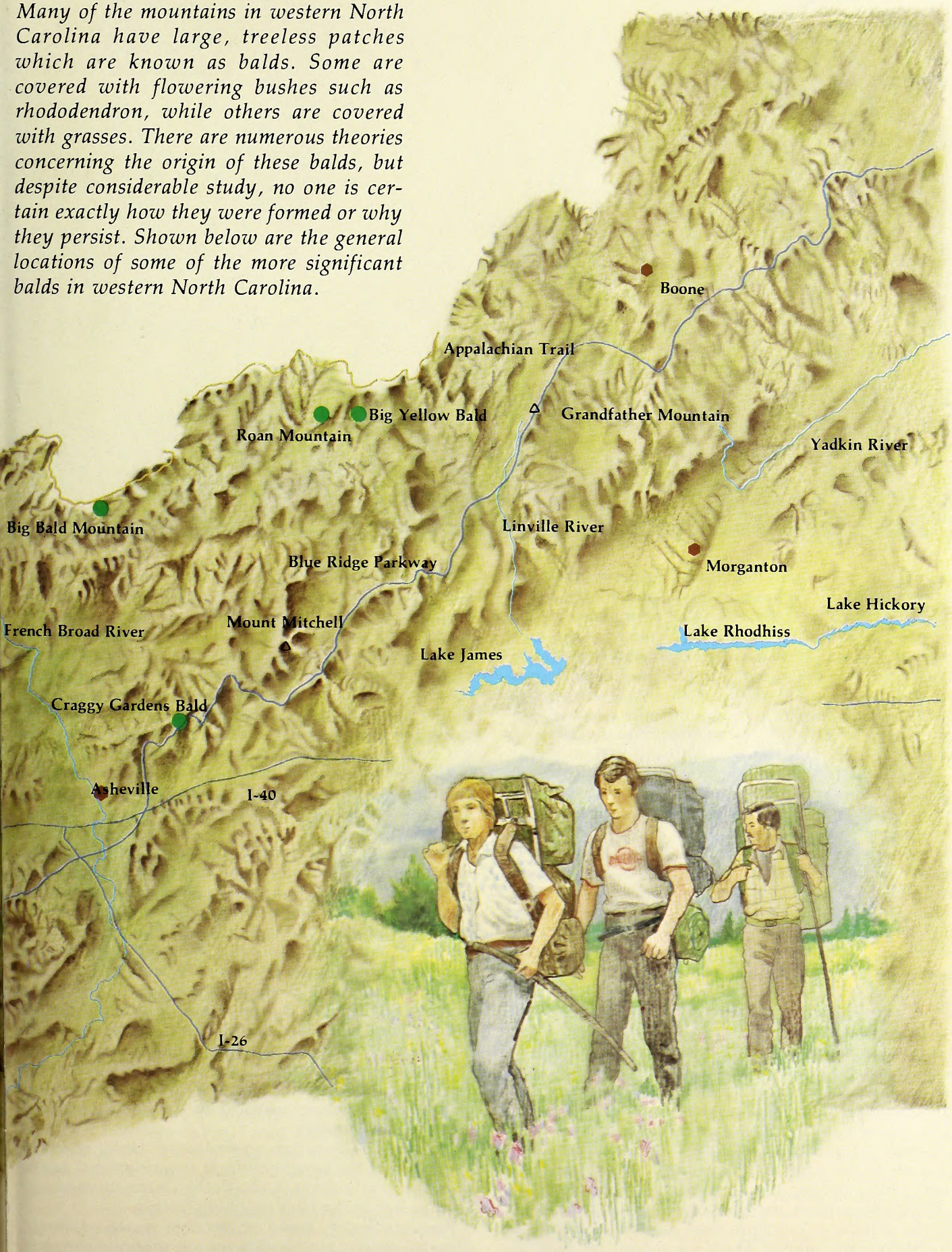
North Carolina's Mountain Balds

Mountain Balds
Appalachian Trail
Major Roads
Rivers and Lakes



map by David Saholsky and David Williams

Many of the mountains in western North Carolina have large, treeless patches which are known as balds. Some are covered with flowering bushes such as rhododendron, while others are covered with grasses. There are numerous theories concerning the origin of these balds, but despite considerable study, no one is certain exactly how they were formed or why they persist. Shown below are the general locations of some of the more significant balds in western North Carolina.



Peggy Payne

This big bare space at Roan Mountain near the Tennessee-North Carolina line is called a bald. Up to 245 balds have been counted in the mountains between north Georgia and Virginia. They comprise the most enigmatic plant community in the Southern Appalacians, according to Dr. Art Cooper, a professor of forestry and botany at North Carolina State University. What causes them has never been firmly resolved. Unfortunately, their future as a mountaintop mystery is as fuzzy as the edge of the encroaching woods.

There is more than one kind of bald, and some are more bald than others. A bald is basically a mountaintop or slope below the timber line where trees generally don't grow. It would seem that trees ought to grow there naturally, but they don't. There are heath or brushy balds, thick with bushes, and there are grass balds like the one called Round — but none with trees.

Not far from Round Bald is a brushy bald whose bushes are famous. This is another one of the Roan Mountain balds, and its natural garden of purple rhododendron is often described as the world's largest. These bushes grow in head-high banks, riddled with paths and clearings. Walking among them is like playing in a maze of tall hedges in a formal garden. When the flowers bloom, a rhododendron festival is held here. When the weather's right, families pass the iced tea at lawn-chair picnics in the almost private rhododendron-guarded alcoves.

As different as the grassy and rhododendron balds are, both places are called "balds." The theories about what made the balds have included fire, Indians, climate, cattle, and combinations of these factors.

Efforts to explain the phenomenon have created a greater volume of literature than on any other kind of mountain plant habitat. There are at least 100 publications on the subject, yet all this study has not produced clear and easy answers. There is no apparent correlation in location since there are balds on round summits, ridges, and in gaps. The balds face all points of the compass. Though they're more common in a range of altitude between 4500 and 5850 feet, the largest number seems to be in a band across the mountains that has a range of a few hundred feet in altitude. The dirt underneath the grasses on the balds is not drastically different from that found in adjacent woodlands.

The Cherokees told traditional stories about giant creatures — a huge lizard, a rabbit as big as a deer, a ferocious hornet — that nested in these places, creating the balds.

Then the Cherokees themselves started getting credit for the balds. One theory was that the Cherokees had burned off the land for use as signal and lookout stations. This is generally discounted now as the sole cause, because burned forests would regenerate. There are signs, however, that trails led to the balds; and since many of them are in view of each other, it is likely that they were used as signal peaks.

Some of the trails to the balds were made not by Indians, but more recently by cattle. Grazing was an important use of these parts of the mountains from the early 19th century until the time of the formation of the Great Smoky Mountains National Park earlier this century. Cattle and sheep were driven up the bald pasturelands for the summer.

One idea is that fire opened these lands and that grazing kept the woodland from covering them again. This theory was advanced by Philip Gersmehl as part of his research at the University of Georgia.

Another theory, based on weather, is that different climatic periods produced a zone at a certain range of

Peggy Payne

Some of the mountain balds are covered with large rhododendron bushes like these on Roan Mountain on pages two and three. The bushes usually reach full bloom during the summer, and they attract many tourists. Other balds (opposite page) are largely covered with grasses. A number of fairly uncommon plants, like the mouse-eared dandelion (left), are found on the balds, and several threatened plant species also make their homes here.

altitudes that would naturally have trouble sustaining tree growth. The idea was that a time of rising temperatures would have caused high altitude kinds of plants to move up the mountains. A cooling period would have made the warm weather species move further down. This could have then created a band in the middle potentially barren of some species.

Cooper thinks a combination of causes have created the treeless land, and he and others say that balds appear to be gradually reverting back to woodland.

Cooper thinks that there's a chance that fire opened the forest, and that Indian activities, grazing, and climatic changes could have kept the trees from returning.

But grazing, Indians, and weather don't seem to be doing the work on these mountaintops that they once might have. The trees are closing in. In about 25 years, Andrews Bald near Clingman's Dome lost about a quarter of its acreage. Gregory Bald near Fontana Dam is about half as big as it was 35 years ago.

The balds as they now exist have their distinctive plant communities. A Botany 235 class at UNC, under the guidance of Dr. Albert Radford, had a look at what grows in the Roan Bald community. Among the threatened species found here are Geum radiatum or avens, three-toothed cinquefoil, Agrostis borealis, green alder, and snake root.

"Right here on the mountain is the only place I know of where I've seen these," said Blaine Ray, a Pisgah National Forest forestry technician. The avens plant whose leaves he untangled from surrounding grass was growing near where a photographer was lining up North Carolina Rhododendron Festival beauty contestants for a group shot. Rhododendron, and those who were honoring this flower, dominated the mountain that day. The more retiring species were simply underfoot.

Several kinds of rhododendron grow at different altitudes on these lands. Ray explained that celebrated rhododendron blooms are better some years than others. "There are two things rhododendron can do, bloom or grow," he said. "In the years they do a lot of one, they do less of the other."

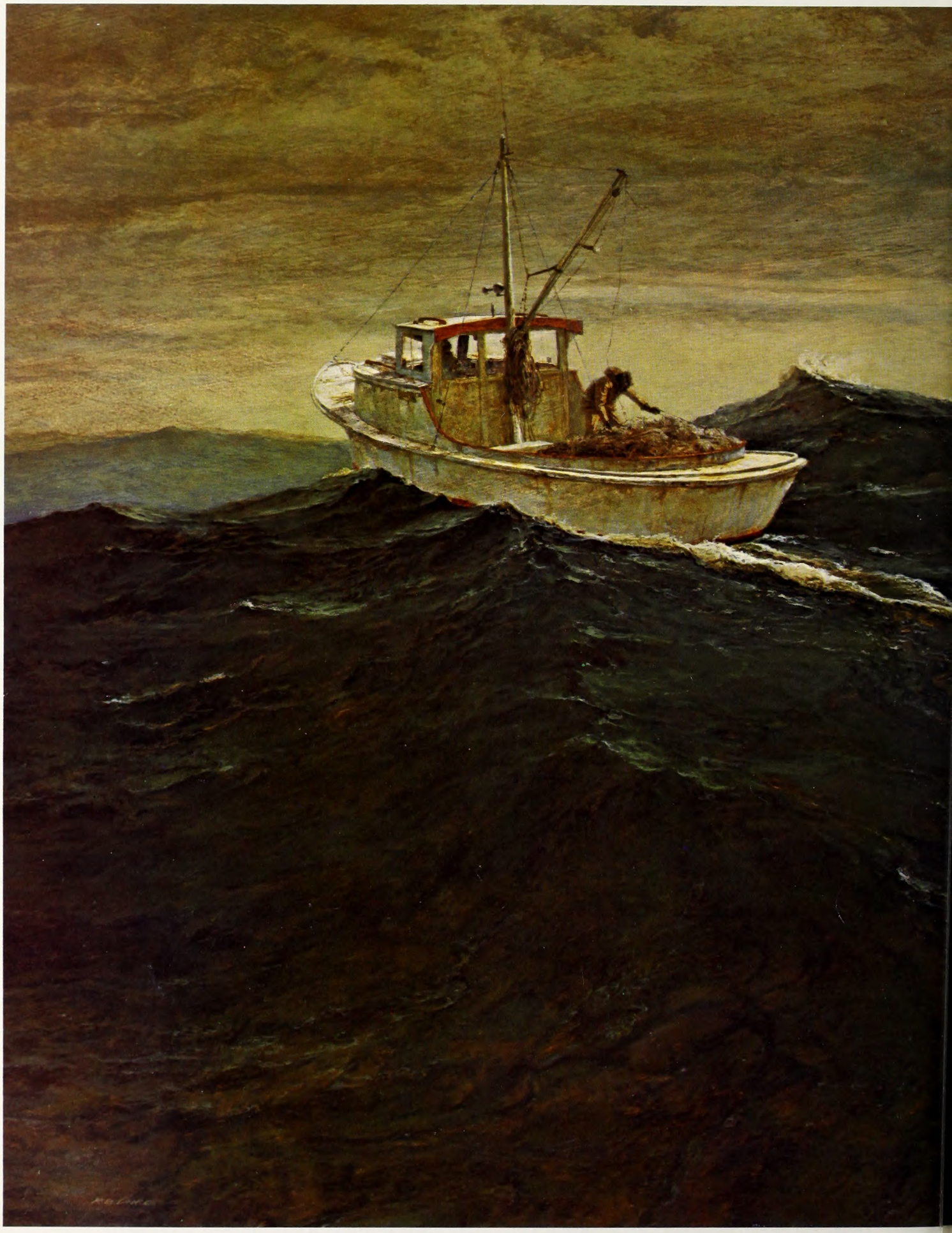
Among the other kinds of plants which he described as distinctive in this area were the three-toothed cinquefol, Gray's lily, tasselrue, and the mouse-eared dandelion. Mountain laurel, blueberry, and some sand myrtle also grow at varying elevations on the balds. Mountain oat grass is common in the grassy balds.

There are efforts to preserve the lands that are known as balds. The Nature Conservancy owns some land in the Roan Mountain area, and the U.S. Forest Service controls large portions of it. Some of the land where balds occur is being managed well by private owners, according to Tom Massengale of the Nature Conservancy.

Not all the balds are in the southern mountains. Cooper says that these form the most notable concentration. The phenomenon also exists in New Guinea and in mountains in the western ranges of this country.

If you're looking for balds in this part of the world, the Roan Mountain communities are easy to get to. This area can be reached by taking Highway 261 north from Bakersville. Andrews Bald is roughly a two-mile hike from the Clingman's Dome parking area. Wayah Bald in the Nantahala Mountains is a short walk north on the Appalachian Trail from the point where the trail crosses Wayah Gap on the road from Franklin to Aquone.

Peggy Payne is a free-lance travel writer and a regular contributor to WILDLIFE IN NORTH CAROLINA.



The Coastal Art Of Bob Dance

Perhaps you thought you just felt a fresh ocean breeze feathering your hair, or maybe you imagined you heard the distant booming of the surf. It could be that you suddenly noticed a faint taste of salt. It's not surprising. Bob Dance's paintings of boats, the sea and the surf can do that to you. This Winston-Salem artist has done many paintings of North Carolina's coast and mountains, and he is already recognized by other professionals as one of the top realists in the country. We thought you'd like to join him for a quick trip down east.

"Return to Beaufort"

Alkyd

There is no way a painter can set up his easel on the tossing deck of a boat and complete a painting of this type. Times remembered, experience, and imagination play a large part in the handling of such subject matter. The ocean is completely a figment of my imagination, while the boat was found docked in Beaufort. The figure is my son posed in my sailing storm suit.

The round stern of this boat is an attractive feature which requires greater craftsmanship than the flat or cutoff stern. Historically, it probably dates back to the working sailing sharpies that were once built in this area.

As in my other rough water marines, the sea in this painting is the result of previous experiences and imagination. To make these elements work together is an interesting, but difficult, task that often takes me more than a month to complete.

"Morehead '78'

Alkyd

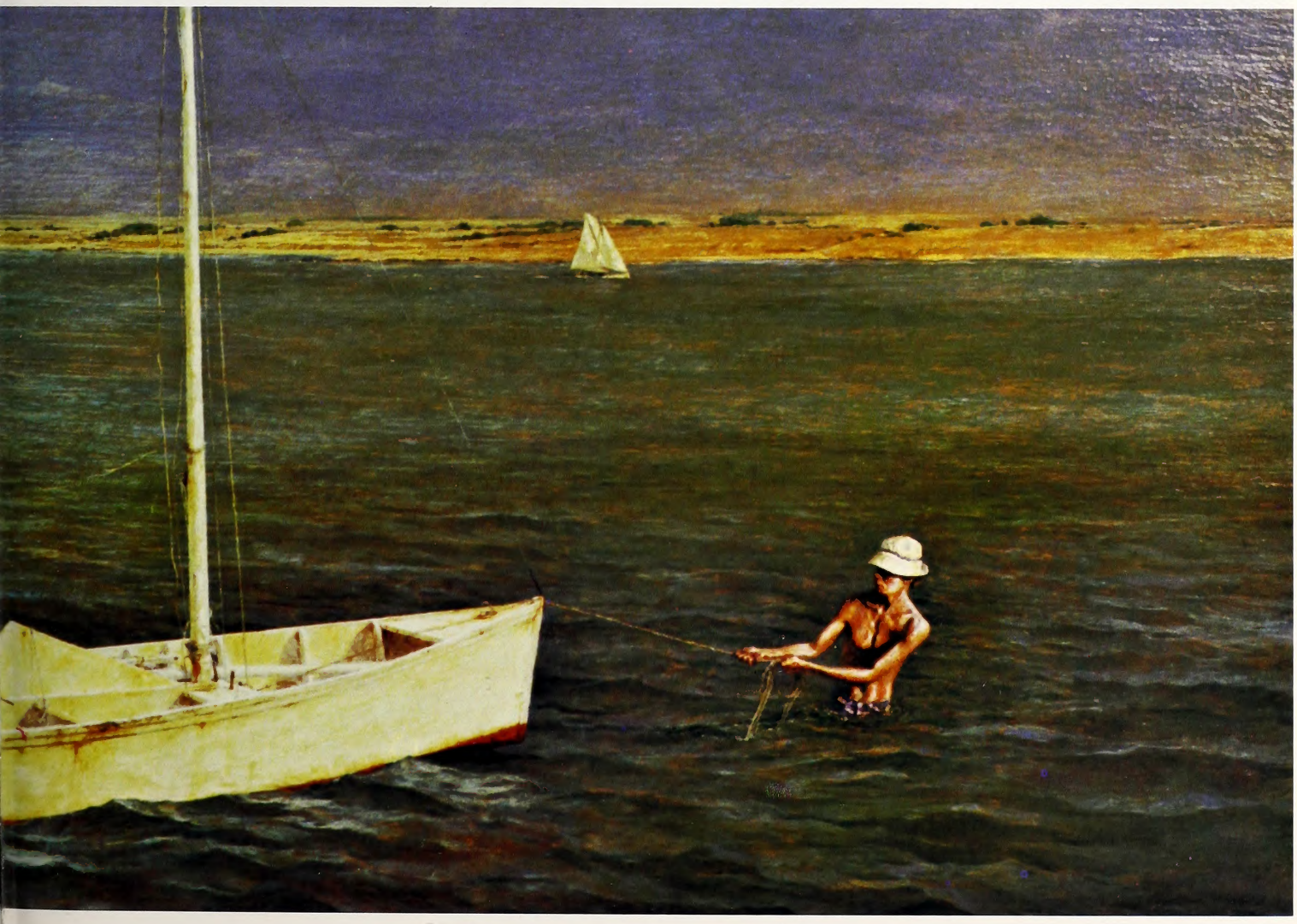
This scene is almost in front of the Morehead cottage we sometimes rent. The bridge to Atlantic Beach can be seen in the distance on the right. Our boys, Scott and Mark, often prowl the sand when the tide is out looking for something weird. There are seven figures in this painting which is a panorama of that location. Both the foreground figures are Scott posed in two attitudes. I seem to paint Mark more often in landscapes than seascapes.

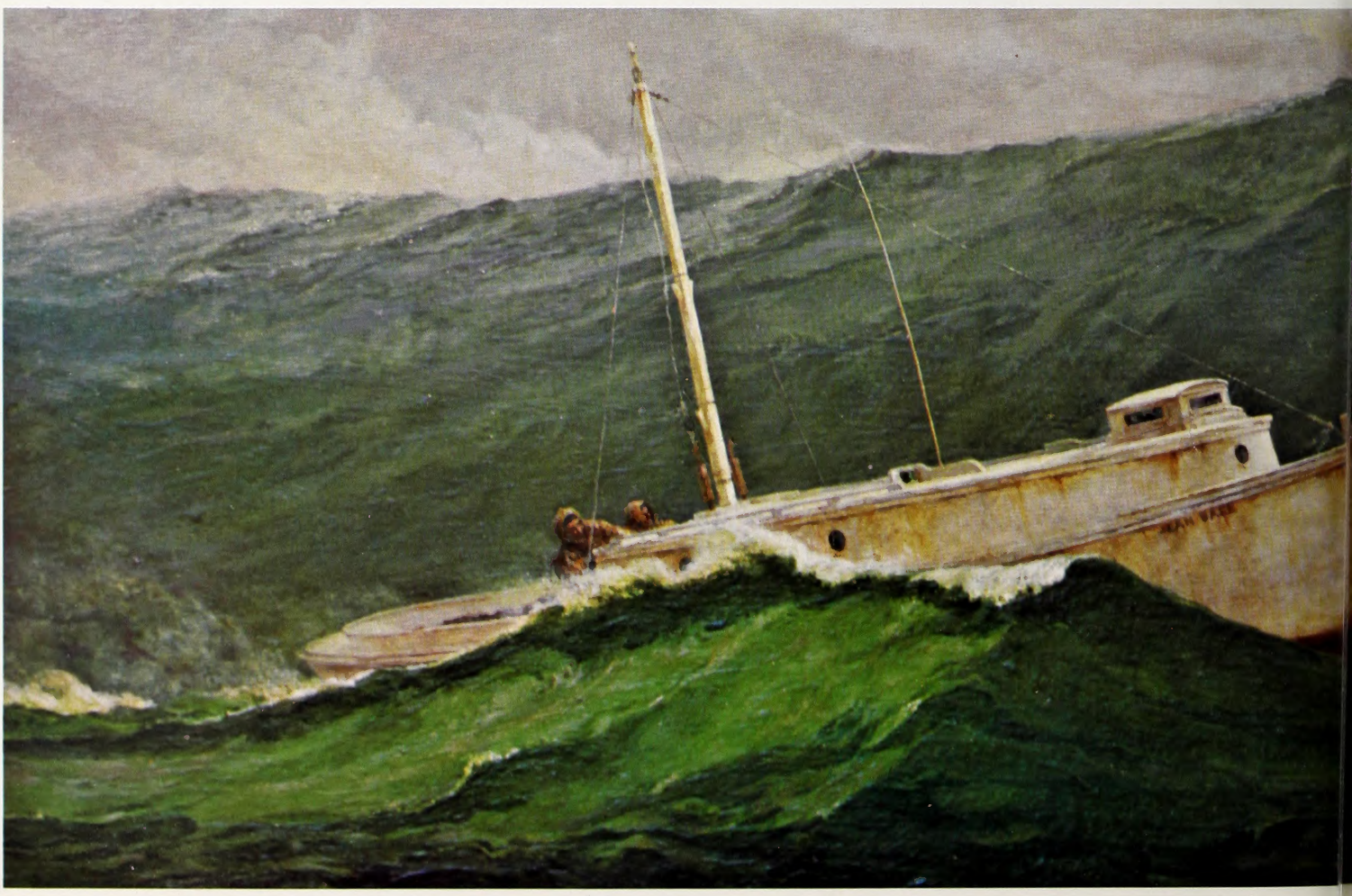
"Wading the Shallows"

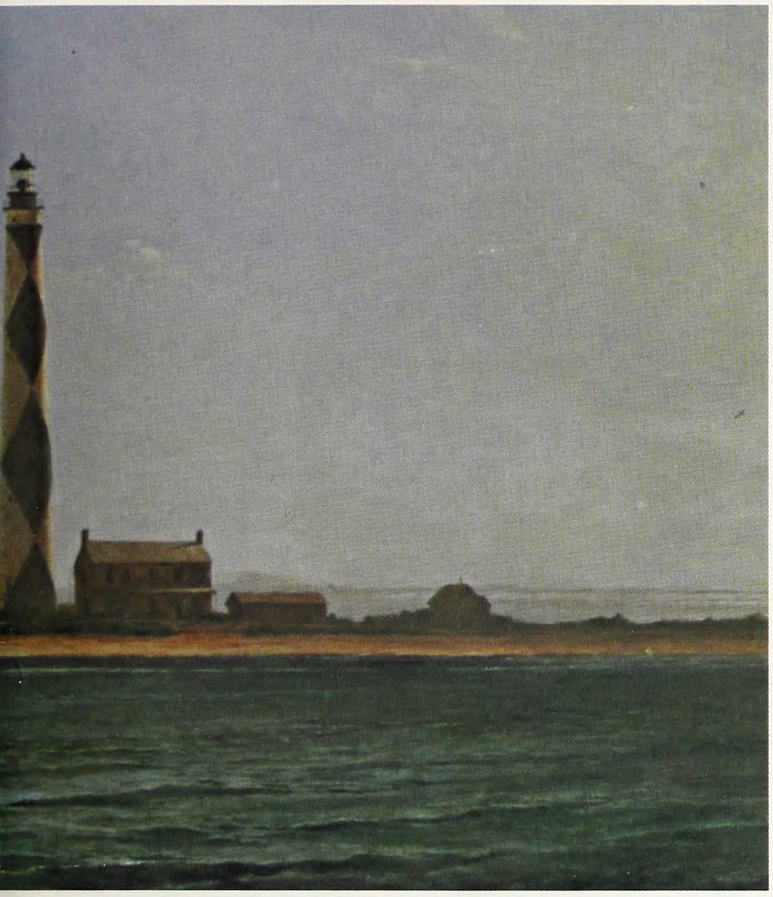
Alykd

Many times an artist will compose a scene that seems familiar to him though it has never actually taken place. This spritsail skiff was found on the Beaufort waterfront near the location of this painting. One can often see ponies on the island across the channel. After returning to Winston-Salem, I posed my oldest son Scott as the figure pulling the boat. Many times I have pulled a sailboat over similar shallows.

The modern racing sailboat has become a mass of lines, blocks, winches, and assorted "go-fast" equipment that may lead one to believe antique designs such as this spritsail skiff, or sharpie, are ponderously slow. Should you try to catch one on a windy day, you would soon discover you were very mistaken. There are records of sharpies averaging 16 knots for three consecutive hours. Once, a few years ago, I was sailing my Thistle on Lake Norman, and was surprised to see a Beaufort-type spritsail skiff ahead of my boat. I was barely able to catch this boat, and when I did, was very surprised to see the owner sitting comfortably amidship without the need of hiking-out to balance his boat. The planing sailboat is not a new idea. These boats were doing it back in 1879.







"Cape Lookout 1978"

Alkyd

Not until I was well into this painting did I hear that beach erosion might take the Cape Lookout lighthouse and the buildings at its base. I do not know the problems involved in saving such a landmark, but feel the loss would be a shame. Certainly one would hope a way will be found to save this area because, not only is the lighthouse beautiful, the building at the base is also wonderful. The last time I read about the problem, the water was only 55 feet away. I truly hope that my painting is not one of the last in the lighthouse's 120-year history.

The boat is from Harkers Island, and was found in the area of the lighthouse and later studied more completely at dock in Harkers Island. There are several boats of this general design at the island.

"The Jean Dale"

Alkyd

I wanted to place the "Jean Dale" on a heavy sea, one you could almost feel and hear. I think this goes back to when I was a very small boy. I used to draw airplanes in dogfights and make machine gun and explosion noises while drawing. Even now, while working on a subject like this, I hear the wind and water and even the cursing.

It never occurred to me until it was too late that almost everyone else stopped drawing after grade school and directed their interests to the more concrete things in life. Even during math tests in high school, I would draw elaborate scrolls between each math problem, thinking that this would somehow get me by. Many of the artists I know are still vitally interested in the same things that fascinated them as children — animals, airplanes, kites, flowers, colors, and boats. In order to make a painting successful, you have to hear the sounds, smell the smells, step into the painting and breathe the air.

"Lightkeeper's House" Watercolor

In 1976, my son Mark and I took a trip down the Outer Banks in search of subjects to paint. Of course, the Cape Hatteras Lighthouse is probably the best known landmark on the banks.

Since everyone is so familiar with the light itself, I decided to paint the stark and clean house near the base. The very dark roof contrasted perfectly with the pure white building, making the composition very abstract against a blue sky.

"Everybody seemed to know that there was going to be a war," recalls Robert B. "Bob" Dance. "The Japanese were shooting machine guns from the roofs of downtown buildings in practice drills against air raids."

That was just before Pearl Harbor, but Dance remembers it well even though he was only about six years old. The Winston-Salem artist was born in Tokoyo in 1934, and his family left just before the beginning of World War II. Yet, despite the vivid memory of the machine guns, the war is not what Dance remembers most about his early years.

"I was interested in art even then, and the Japanese culture unquestionably had a lot to do with this," says Dance. "The Japaneses are very artistic in everything they do from serving food to wrapping packages. I think the earliest painting I did was a watercolor in the Oriental brush-painting style of a flower or plant. I must have been about five years old."

Dance's family came to Richmond, Virginia, then moved to Kinston in the early 1950's and lived there until about 1956. Dance was a student at the Philadelphia Museum College of Art during this period, and painted several covers for WILDLIFE IN NORTH CAROLINA. In the early 1960's, Dance settled in Winston-Salem, which he describes as "a wonderful town for an artist; perhaps the best in the South."

His fame as an artist has grown steadily over the years, and his work is included in numerous private and corporate collections. His paintings, both watercolors and Alkyds, have twice been featured in AMERICAN ARTIST magazine, and in the book. "Forty Watercolorists And How They Work." He has won many first place awards, including three from the North Carolina Watercolor Society, and several works are also part of the permanent collection of the North Carolina Museum of Art.

Readers of PLAYBOY magazine who are familiar with the Ribald Classic series have seen Dance's work since he did the woodcut illustrations for many of these in the 1960's. "They chose me because there weren't many woodcut artists around at the time" says Dance modestly. "I did a great many woodcuts early in my career, but now I concentrate mostly on watercolors and Alkyds."

Dance credits the Philadelphia school of realists as the major influence on his style, especially painters like Thomas Eakins, Winslow Homer and Henry C. Pitz. Andrew Wyeth has also been an influence; and as Dance says, "It is hard for a painter in the realist style to see Wyeth's work and not be influenced, but there is still nobody who can touch him."

Dance's interest in wildlife and the outdoors — especially the coast and mountains — goes back a long way.

"I have illustrated covers for several wildlife books; and although I don't hunt much anymore, I love guns," says Dance. "I like the way guns look, and I'd probably collect them if I could afford it. I also like to fish and sail, and I've spent a lot of time in the area around Beaufort, Harkers Island and Morehead City. Many of my subjects have come from that area."

Dance considers discipline a very important asset for any artist, and he often spends a month or more on a painting.

"I approach painting as a job, and I've found that you can't wait for the onset of an artistic mood," says Dance. "If you start painting and get into it, the mood usually follows. I work every day from about 8:30 in the morning until about five in the afternoon. Sometimes, I'll shoot a photograph of a complicated subject like a boat or machine in order to be accurate, but I combine such reference material with memory and imagination. In order to get the right atmosphere in a painting, I try to recall the way I first saw the subject.

"I used to think that painting would get easier over the years, but it gets tougher all the time because I have become more critical of my work," says Dance. "Unfortunately, realists are not often taken seriously as true artists, and I would like to see that change."

Those who view the paintings shown here are likely to share Dance's hope that critical acclaim will someday match popular acclaim for accomplished painters who choose the realist mode, and it's certainly a pleasure to have Bob Dance's work back in WILDLIFE IN NORTH CAROLINA after an absence of more than two decades.

By Jim Dean

Can You Top These Records?

Here's a closer look at North Carolina's current fresh-water fish records.

Tom Dula (left) and Bill Dula with the state record striped bass

The big one doesn't always get away. Yet, when it comes to landing the whopper fish of a lifetime, there is overwhelming evidence that skill is often spelled L-U-C-K.

Logically, you'd expect the capture of a record fish to be the master stroke of an expert angler — the predictable result of years of accumulated skill, knowledge of fish habits, careful planning and persistence. Not so. With few exceptions, almost every state record fish (North Carolina has 25 fresh-water records) was an unexpected bonus.

The fishermen involved may have demonstrated admirable skills or instincts when the big moment occurred, but darn few will admit that they were not at least as surprised as the fish when the hook was set.

That being the case, there is obviously no way that we can offer any useful advice on how you might go about catching a state record, but the staff of WILDLIFE IN NORTH CAROLINA thought you'd like to read brief accounts of how some of the current state record fish were caught.

Also, just in case you should happen to catch a fish in either fresh water or salt water and want to enter it as a possible record, there are several things you should know. Joel Arrington keeps up with North Carolina's fish records, and his address is: Travel and Tourism Division, 430 N. Salisbury St., Raleigh, N.C. 27611.

"Many people mistakenly believe that they automatically set a new record whenever they catch a fish that's bigger than the listed record." says Arrington. "That's not the case. In order for any fish to become a state record, an application must be completed and certified by the Travel and Tourism Division. If you catch a fish that you think is a new record, you should write me at the address listed above and ask for an application to fill out and return."

Arrington also offered several tips which will help ensure that your fish actually becomes a certified record.

"First, make sure that the identification of the fish is accurate," said Arrington. "Take a good, close-up photograph or have a fisheries biologist identify it. Second, make sure the fish has been weighed on certified scales, such as those found in a grocery store. Be sure to make notes of the date caught and location, and include the names of witnesses, if there were any. After you've weighed the fish, freeze it whole, then write me for the application. Later, you may want to have your catch mounted by a taxidermist."

Now that you know what to do, pick the record you want to break and get busy. You're not going to catch anything sitting there reading.

Kirk Murphy with his brown trout

Brown Trout
12 pounds, eight ounces
Caught by Kirk Murphy
July 6, 1974

"Everybody had been telling me that there was a really big brown trout down in the South Toe River near where I live," recalled Kirk Murphy. "My father, Jack Biddix, and I went down there and sat on a rock overlooking this big pool. I think it was late morning, and I remember throwing a rock into the water which was off color from some recent rain and upstream construction.

"Right after I threw that rock, I cast a night crawler out into the pool, and that big trout came right up and took it." said Murphy, who was 12 years old at the time. "At first I though I was hung, but then the fish started moving; and if my father hadn't been there, it would have pulled me in. I had only 10 pound test line; but after about 10 minutes, we walked off the rock and pulled him in."

Murphy's whopper brown trout was mounted by Sam Loftis, a taxidermist who lives at Rock Creek. The world record brown trout was caught at Nahuel Huapi, Argentina by Eugenio Cavaglia in 1952. It weighed 35 pounds, 15 ounces.

Charles Presnell with his muskellunge

Bluegill
Four pounds, five ounces
Caught by Dan Case
July 27, 1967

Dan Case had his fisherman's dream come true at the age of 14. He caught a State record fish.

"I was fishing at Edneyville Pond in Henderson County with my dad when I caught the bluegill," Case recalled. "I was using a catalpa worm in about two feet of water."

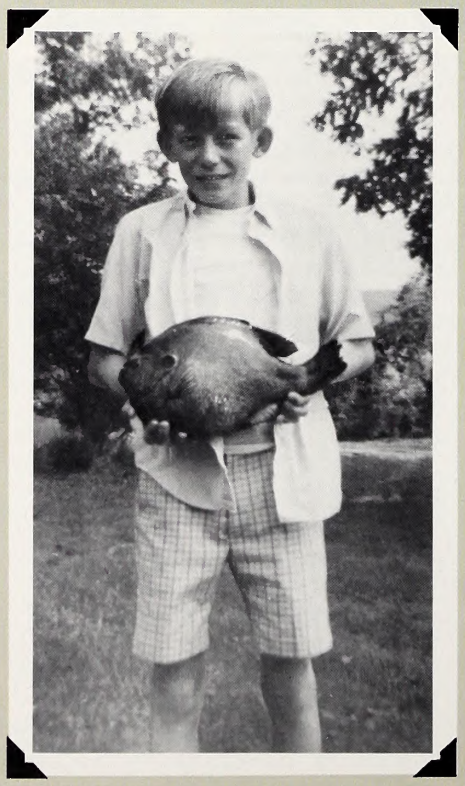
The fish fought hard, but Case landed him using techniques well known to adolescent anglers.

"I was real excited and just dragged the fish up onto the bank," he said. "It was huge. When dad reached down to remove the hook, the fish made sort of a barking noise that sounded just like a dog."

Dan and his dad took the fish to town, where no one would believe it was a bluegill. Frank Drake, a writer for the Asheville Citizen, showed it to a visiting biologist from N.C. State University, who confirmed its identity.

"I've got the fish mounted on my wall now," said Case, "I still love to fish, and go every chance I get when I'm not doing carpentry work. I bass fish in South Carolina a lot."

The world record bluegill weighs four pounds, 12 ounces, and was caught in Ketona Lake, Alabama by T.S. Hudson in 1950.



Dan Case and his bluegill

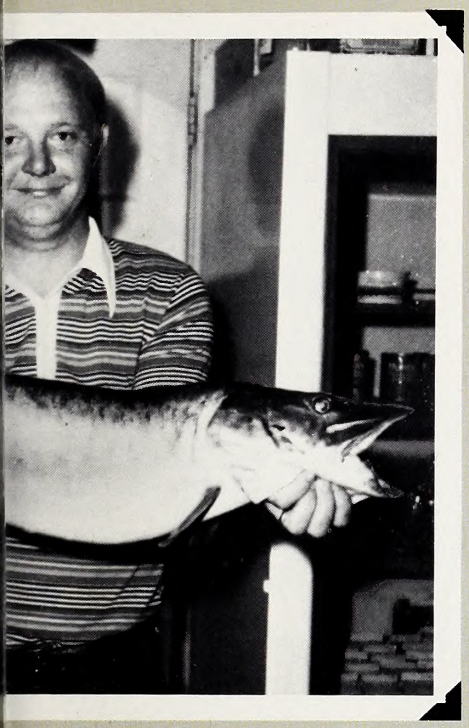
Muskellunge
16 pounds, two ounces
Caught by Charles Presnell
May 5, 1977

Charlie Presnell made his first muskie count. He caught his record fish one Sunday afternoon when he got bored and decided to "kill some time."

"It was a real hot Sunday afternoon, so I decided to fish Lake James for a few hours," the Marion man said. "I was casting a deep-diving plug into shore when the fish hit. It was a monster."

The huge muskie gave Presnell quite a tussle, and he confided that he almost gave up. The fish jumped several times, shaking its head and trying to throw the plug. Getting it into the net was a particularly wild affair. "We'd lead the fish into the net, then it would panic and the fight would be on again," Presnell recalled.

Presnell still bass fishes quite a bit when he's off duty from the Marion Fire Department. He hasn't caught his second muskie yet, but for the time being, he's not complaining about holding a State record. The world record muskie, which was caught in the St. Lawrence River in New York in 1957, weighed 69 pounds, 15 ounces. Most of North Carolina's muskies have been too recently stocked by the Wildlife Commission to have reached that size yet.



Chain Pickerel
Eight pounds
Caught by John Leonard
February 13, 1968

You don't need a $10,000 bass boat to catch a record fish. John Leonard of Macon, North Carolina, caught his State record pickerel while fishing from the shore of Lake Gaston.

"I like to fish early in the year because it's less crowded," Leonard said. "Most of the time, I bank fish for crappies and jacks (pickerel) in water that's three to five feet deep."

At first Leonard didn't consider his eight pound jack an unusual catch. After all, one of his companions had caught a jack weighing seven pounds, 12 ounces a few minutes earlier. If a Wildlife Enforcement Office hadn't come by and looked at the fish, he never would have bothered to enter it.

"I was fishing with a large shiner for bait when the jack hit," said Leonard. "It put up a pretty good fight."

Leonard says he's caught some other big pickerel in Lake Gaston since he set his record, but none approaching his eight-pounder. Incidentally, taking a world record pickerel is not out of reach anywhere in the fish's range. The fish to beat weighed nine pounds, six ounces and was caught at Homerville, Georgia in 1961.

Largemouth bass
14 pounds, 15 ounces
April 26, 1963

Walleye
13 pounds, four ounces
May, 1966

White bass
4 pounds, 15 ounces
July 27, 1966
Caught by Leonard Williams

Leonard Williams says he fishes the same way everybody else does; but unlike the others, he holds three North Carolina fish records. He caught the first one — a largemouth weighing nearly 15 pounds — way back in 1963. In 1966, he added two other records, the walleye and white bass.

While Williams may fish like other anglers, there is one significant difference. He tries to fish at least five days a week, and no one fishes that much without learning a lot. Indeed, Williams sometimes guides at Santeetlah Lake, and used to guide on Fontana.

"I caught my record largemouth in Santeetlah," said Williams. "I was using a plug and the fish fought hard, but I think I had another one hooked this spring that might have been bigger. Unfortunately, he got away." Williams also caught his record walleye in Santeetlah.

"I was using a jig I tied myself," said Williams, "and I hooked the fish in about five feet of water where a stream enters the lake.

"I caught the big white bass while I was guiding a client from Ohio," said Williams. "We were fishing in Fontana just before dark; and when this fish hit, it really tore me up because it was very strong. It took me five or six minutes to get it to the boat and I was using hefty tackle. By the way, the fish hit a top water plug."

The world records for the three species caught by Williams include a 22 pound, four ounce largemouth caught in 1932 by George Perry in Montgomery Lake in Georgia; a 25-pound walleye caught in Old Hickory Lake in Tennessee in 1960 and a five pound, five ounce white bass caught from Ferguson Lake in California in 1972.

Tiger Muskie
Seven pounds, eight ounces
Caught by Don Francisco
November 16, 1978

Don Francisco had bream on his mind when he took his two sons fishing on Fontana Lake last November.

"I was casting a Rapala towards the shoreline when I got a hit," the Franklin angler explained. "The fish didn't fight exceptionally hard, but was very strong and stayed deep and away from the boat."

Francisco fought his fish for 25 minutes before landing it and said his "hands were so numb I could hardly hold the rod." When he got the fish into the boat, he didn't know what it was.

"At first I thought it was a northern pike, then I realized there are no northern pike here," he said. "So, I figured it had to be a muskie, but the body shape wasn't right, and I didn't really know what it was."

Jay Davies, a Commission fisheries biologist, confirmed Francisco's doubts by identifying the fish as a Tiger muskie; a cross between a northern pike and a muskie that the Wildlife Commission has stocked in many mountain lakes.

Ironically, it seems appropriate for Francisco to hold the Tiger muskie record in the Tar Heel State.

"I grew up on a dairy farm in northern Michigan and went fishing for northern pike and muskies three or four times a week," he recalled. "After my dad and I finished the evening milking, we'd often go down to the river for a few hours. Northern pike were as plentiful there as bream are in North Carolina."

Don Francisco with his tiger muskie

Max Rogers shows his rainbow trout

Rainbow Trout
14 pounds, one ounce
Caught by Max Rogers
March 6, 1949

If you want to catch a State record rainbow, it might be a good idea to take a casting rod and plug and go bass fishing. This might sound strange, but it worked for Max Rogers and his record still stands after 30 years.

"I was fishing with an L and S bass plug on Glenville Reservoir when the fish hit," Rogers recalled. "He put up a real fight and jumped a lot, but I got him in the boat after about 20 minutes. I thought I'd enter him in the FIELD AND STREAM fishing contest, so I weighed the fish in Cullowhee and went home."

Big fish stories have a way of getting around and Rogers soon found himself somewhat of a celebrity.

"I had the fish in a freezer in my furniture-appliance store in Waynesville, and soon it was the biggest show in town," he recalled. "I finally opened the store on a Sunday night so folks could look at the fish, and there was a steady stream of people in for the next three weeks. Then the papers got hold of it, and I got calls from all over the South. I loaned the fish out, and it was exhibited in Knoxville, Atlanta and Raleigh. Today, it's hanging on my wall."

Rogers still gets calls about his fish, which isn't surprising. It falls a bit shy of the 42 pound, two ounce world's record rainbow taken at Bell Island, Alaska in 1970, but it's still one of the biggest rainbows ever caught in the Southeast. Rogers admits that he has to work a bit now and then to keep bread on the table, but his real vocation is, and always has been, fishing. He's retired now, and spends a lot of time stream fishing for trout.

Freshwater Striped Bass
39 pounds, four ounces
Caught by Bill Dula
May 10, 1969

Bill Dula is another angler who made his first fish count. His first striper stands as the State fresh-water record.

"I was fishing near a trestle on Lake Hickory when I hooked the fish under the bridge," The Granite Falls man recalled. "The striper made some very long, strong runs and it took me about a half-hour to get it up to the boat. It broke through the net when we tried to bring it aboard."

Dula thought the fish was a carp at first because he had never seen a striper before. Several other fishermen also thought it was a carp, but eventually someone recognized the fish. Dula says he's only caught a few stripers since, and no big ones, but he'd like to change that.

"Next summer, I'm going to retire to my cabin on the lake and fish a lot," he said. "I'd like to see if I can catch a bigger one.

The International Game Fish Association, which recently took over the fresh-water fishing records from FIELD AND STREAM, does not recognize a world's record fresh-water striped bass. However, the unofficial credit for the biggest inland striper goes to Arizona where a 59 pound, 12 ounce whopper was hauled out of the Colorado River in May, 1977.

NORTH CAROLINA FRESHWATER GAMEFISH RECORDS

SPECIES	*WT.*	*LOCATION*	*LURE OR BAIT*	*DATE*	*ANGLER*
largemouth bass	14-15	Santeetlah Reservoir	L&S Bass Master	4-26-63	Leonard Williams
Roanoke bass	2-8	Hope Mills Lake	artificial worm	9-8-78	Freddy H. Casten
rock bass	10 ozs.	South Fork New River	Mepps Comet	7-16-76	John Collins
smallmouth bass	10-2	Hiwassee Reservoir	spring lizard	6-53	Archie Lampkin
striped bass (landlocked)	39-4	Lake Hickory	spring lizard	5-10-69	Bill Dula
white bass	4-15	Fontana Reservoir	Skip Jack	7-27-66	Leonard Williams
bluegill	4-5	Edneyville Pond	catalpa worm	7-27-67	Danny Case
bowfin	17-3	Lake Wylie	live minnow	2-1-76	Dickie Helms
buffalo	26-10	Lake Wylie	dough	2-19-76	J. Gary Hill
carp	45-2	Badin Lake	Big B	6-8-74	Max E. Lowder
channel catfish	40-8	Fontana Reservoir	Hellbender Lure	4-15-71	P.P. Paine
chain pickerel	8	Gaston Reservoir	minnow	2-13-68	John H. Leonard
crappie	4-13	Jordan's Lake	minnow	4-4-61	W.T. Roberson
muskellunge	16-2	Lake James	Psycho Scout	5-15-77	Charles L. Presnell, Jr.
yellow perch	2-3	Jones Lake	Broken back MirroLure	6-10-76	Edge Hendrix
sauger	5-15	Lake Norman	Rapala	7-25-71	David Shook
American shad	7-15½	Tar River	shad dart	4-10-74	R.S. Proctor
hickory shad	2-13	Pitchkettle Creek	Reflecto spoon	2-17-74	John W. Moore
shellcracker	4-4	Lee County pond	worm	2-3-68	Bill Arnold
tiger musky	7-8	Fontana Reservoir	Rapala	11-16-78	Don Francisco
brook trout	4-4	Norton	worm	4-2-78	Ricky Potts
(tie)	4-4	Davidson River	Rapala	7-5-78	Bobby Ray Dortmundt
brown trout	12-8	South Toe River	worm	7-6-74	Kirk Murphy
rainbow trout	14-1	Glenville Reservoir	L&S	3-6-49	Max O. Rogers
walleye	13-4	Santeetlah Reservoir	jig	5-66	Leonard Williams
warmouth	1-13	Richmond County pond	minnow	5-7-76	Emma Sears

Letters

Dear Sirs:

My friends and I would like to thank you for the many years of enjoyment we've gotten from North Carolina streams and fields. We are in full support of your program and we would do everything possible to help protect and promote our hunting and fishing rights in North Carolina. Thank you for your time and trouble.

Mike Coats
Clayton

Dear Sir:

I just had to write to you in response to "An Obsession With Trout" by Jim Dean. It is without a doubt the most truthful, funniest, incredible account of trout fishermen I have ever read. My husband was so clearly defined in this article I could hardly believe what I was reading.

I'm sure I will be defined as a fisherman's wife who just doesn't understand the life of her husband, but I have to say obsession is the only word for a true trout fisherman.

David and I have been married for three years. On our first anniversary, he was gone for a week's fishing trip. That was my first hint of the intensity of his hobby. We receive 8 magazines every month on fishing. We have spent anywhere from $1.00 to $40.00 on several books on subjects ranging from techniques of fishing and fly patterns, to methods of fly tying and trout streams in North Carolina. Every week we receive at least one package from a fishing gear store. These I have found to include various feathers, hooks, yarns, fly floatants, and thread. During our married lives we have purchased 4 rods, several reels, 3 vests, 3 sets of waders, and mounds of fishing necessities. Every vacation we have had, I have spent at home, and David has taken fishing trips. Every weekend he doesn't work, and every afternoon he is off is spent fishing. We are now planning to move so that he can be closer to his favorite fishing spots. If the weather is so bad he can't fish, or the fish don't like his flies, he contents himself by sitting at his fly tying table for hours and calling me in to praise each achievement. Since camping is a necessity to this sport, we have recently acquired a tent, lantern, cook stove, 2 sleeping bags, a back pack and as soon as possible a vehicle suitable for travel to these trout streams. I was told last week that yet another rod had been ordered and then just this morning that a new pair of waders and new boots would have to be purchased before long.

I just wonder if there are other women like me or if I have won the prize of all fishermen.

Needless to say, this sport is costing a fortune. It seems to me that some company would be willing to donate everything for David with the agreement that their name be displayed on everything. As much as he is on the streams and rivers, and as many people that ask his advice on suppliers, this would be well toward their benefit. Wishful thinking I guess. But there must be a bright side to this story!

I'm just pleased to find that in one of David's favorite magazines this humorous account of fly fishermen was written.

Thank you all very much. Especially Jim Dean.

Lynn B. Cannon
Spruce Pine

Dear Sir:

I went to a couple of bass fishing tournaments this spring (I'm not expert enough to enter any of them) and was really surprised to see the interest in the bass that these fishermen displayed. At the weigh-in one evening, I asked several of the fishermen about organizations that were doing any research on the bass; and I found out that the Bass Research Foundation has funded ten projects over the United States since 1974, with a budget for these of over $1,100,000.

So far as I know, the only chapter of the Bass Research Foundation in North Carolina is in Asheboro, N.C. I hope more bass fishermen will look into this organization and consider forming more local chapters. I'm sure that the Asheboro Chapter (PO Box 1534Y, Asheboro, N.C. 27203) would be glad to help them.

Jack W. Miller
Edenton

Dear Sir:

I am 12 years old and I wish to send out a spring reminder. During the spring and summer there are many snakes, poisonous and non-poisonous. Before you behead, shoot or club that snake in your yard or in your path, remember snakes of all kinds play an important role in the ecosystem by controlling rodents, moles and other similar species. That snake in your yard or garden may be a blessing in disguise.

Paul Wesley Hofferbert
Durham

Dear Sir:

The last winter I spent in my western North Carolina native valley of Cullowhee, I made a self-feeding bird feeder of a clay flower pot. I believe I read the directions for making it in your publication. I attached it between double windows of our living-dining room area, where we could watch the birds close up without disturbing them.

The first snow fall brought two black-capped chickadees, among many other birds. We enjoyed their antics immensely. After our feathered friends had plenty of food, we stopped the feeding program. One day my sister said, "Why are the two black-capped chickadees still at the feeder?" They were building a nest in the feeder. We watched while they carried feathers, sticks and moss and deposited it in the empty feeder.

After a few weeks, we heard babies moving around. Then two tiny black-capped heads appeared, peeping over the rim. We talked to them, and as they are a friendly birds, they allowed us to gently stroke their heads as they would sit on the rim of the nest.

One night we heard much stirring in the nest. We knew no cat or animal could reach them, yet we were fearful. The next morning, we went out to look for our baby friends. The feeder was empty. Sadly, we looked around the yard. There, underneath a huge boxwood, sat the babies with the parents feeding them. As an avid nature lover, I recorded this story in small oil pictures.

Sara Belle Moseman
Weirsdale Fla.

Boating Safety Poster Is Winner

Ken Taylor

Mike Overton (right) and Don Huddler present award to Phillip Renfrow.

PHILLIP RENFROW OF Kenly Elementary School in Kenly, North Carolina, is the premier young boating artist in the State. Philip was the State winner in the N.C. Wildlife Resources Commission's Boating Safety Art Contest, which was open to all of the State's fifth graders.

As Phillip's fine work and verse plainly show, unsafe boating can be dangerous. Budding artists had the choice of designing the safest boat in the world, drawing a picture showing safe boating practices, designing a flag or emblem depicting warning, hazard or safety information to fellow boaters, or drawing a cartoon showing someone ignoring an established boating safety practice. Phillip opted for the cartoon, and effectively pointed out that dangling your legs over the bow isn't such a hot idea. Phillip will receive a $50 savings bond for first place finish.

There were also eight regional winners, including Phillip, and they are listed below. Regional winners will receive a plaque, and $50 will be donated to their school art program. Also listed are finalists in the contest, each of which will receive a Certificate of Recognition.

REGIONAL WINNERS

Norman Davis, Benhaven Middle School, Olivia, North Carolina
Debra Ann Gwaltney, Pamlico Junior High School, Bayboro, North Carolina
Matt Harbert, Carmel Academy, Charlotte, North Carolina
Barry Kennedy, Piney Creek School, Piney Creek, North Carolina
Jon Newton, Central Elementary School, Hickory, North Carolina
George Penland, Cowee Elementary School, Franklin, North Carolina
Phillip Renfrow, Kenly Elementary School, Kenly, North Carolina
Sonya Richardson, Central Academy, Charlotte, North Carolina

FINALISTS

Tamara Ballard
Boyce Banks
Robin Calfee
Theresa Colina
Pam Davis
Kris Drum
Linda Farrar
Crystal Hagen
Joseph Harris, Jr.
Nancy Hibbs
Joe Woodard
Richard Hicks
David Holliman
Brian Johnson
Carol Jordan
Michelle Lane
J.D. Loughlin
James Loutit
Ricky McLendon
Aaron Melgares
Dedra Nations
Eric Ramsey
Lisa Ratliff
Andy Reavis
Diane Sexton
Lashawn Shepard
Tony Smith
Everette Stroman
Shelton Sullivan
Harold Syms
Dana Tyndall

Texas Stocks Channel Bass In Reservoirs

THE STATE OF TEXAS apparently likes to introduce saltwater fish into fresh water. Recently, WILDLIFE IN NORTH CAROLINA reported that the Texas Parks and Wildlife Department had successfully stocked flounder in fresh water. Now, they're doing the same thing with the channel bass or red drum, which, by the way, is North Carolina's State fish.

Fisheries biologists have found that red drum show phenomenal growth rates when stocked in fresh water. A recent survey of one stocked fresh-water lake turned up red drum weighing up to 20 pounds, and the fish were only three years old. Their growth rates in salt water are much slower. Lone Star biologists believe the fish are best suited to power plant reservoirs which release heated effluents.

New Crop For Anglers

THE UNIVERSITY OF NORTH CAROLINA'S Sea Grant program may have found a new crop for Tar Heel commercial fishermen. Biologist Don Kapraun is studying the feasibility of establishing a nori harvesting operation in southeastern North Carolina. Nori is a lettuce-like algae that is harvested extensively in the Orient where it is used as a seasoning and protein supplement.

According to Kapraun, up to three crops of the algae could be harvested in a single growing season. He also found that the plant contains 37 percent protein per dry gram, rivaling the best of the nori grown in Japan.

The algae thrives in polluted waters, which is a mixed blessing. Researchers hope that nori taken from polluted waters will still be safe for human consumption.

Environmental Workshops Set

THE N.C. DIVISION of Forest Resources will conduct three environmental education workshops this summer with the assistance of the N.C. Department of Instruction, N.C. State University School of Forestry, and the Division of Continuing Education. Each workshop will count three Continuing Education Units and the cost of each will be $5. Sessions will run from nine a.m. through four p.m., and locations and dates are as follows:

A workshop will be held at the Clemmons State Forest from Monday, July 16 through Friday, July 20. The Clemmons State Forest is 15 miles east of Raleigh on old U.S. 70.

A workshop will be held at the Tuttle State Forest from Monday, July 20 through Friday, August 3. The Tuttle State Forest is two miles west of N.C. 18 approximately halfway between Morganton and Lenoir.

A third workshop will be held at the Holmes State Forest from Monday, August 6 through Friday, August 10. Holmes State Forest is located on Kanuga Road between Brevard and Hendersonville.

The workshops will be of special interest to teachers conducting classes from the kindergarten through high school levels, and will incorporate creative techniques for teaching academic subjects in an outdoor environment. To register, contact Joe Hogue or Barbara Strickland at the N.C. Division of Forest Resources, P.O. Box 27687, Raleigh, N.C. 27611 or call 919-733-2162.

Pork Barrel Is Old Tradition

PORK BARREL. The term is often used to describe projects that benefit only a few special interest groups, but many people don't know where the term originated.

The term "pork barrel" has its origins in the pre-civil war South. On many plantations, slaves received a weekly meat allotment. The meat was usually pork, and all the slaves gathered together to get their ration once every week. Favorites were often rewarded with extra rations, so considerable politicking went on around the pork barrel.

Fishing Is First Choice

Readers Pick Favorite Topics

ACCORDING TO A reader interest survey distributed in most of the February issues of WILDLIFE IN NORTH CAROLINA, fishing, hunting and N.C. travel and history appear to be the most popular items covered in the magazine. Each of the other topics — there were 11 in all — also seem to be of considerable interest. The full results of the survey are listed in the accompanying table.

"The response to our recent survey was fantastic," said Duane Raver, editor of WILDLIFE IN NORTH CAROLINA magazine. "Of the 55,000 survey cards that were distributed, over 9,650 have been completed and returned so far. That's a response rate of better than 17.5 percent which experts tell us is a very good rate of return. This certainly indicates a lot of interest in the magazine. The input from this survey, as well as the letters and comments which accompanied some of the responses, will be a great deal of help in planning future magazine issues.

Every subscriber did not receive a survey questionnaire because cards were ordered based on the magazine's circulation when the survey was designed. The editors had no way of knowing that the publication's popularity would grow so rapidly that the magazine's circulation would rise from less than 55,000 to almost 72,000 subscribers during the several months it took to implement the survey.

		No. Responses			
Rank	*Topic*	*Always*	*Frequently*	*Occasionally*	*Seldom*
1	Fishing	5,839	1,980	1,221	719
2	Hunting	5,594	1,787	1,550	1,312
3	N.C. Travel-History	4,472	2,722	1,654	699
4	Game-Fish Management	3,963	2,855	1,914	609
5	Nongame Wildlife	3,935	2,621	2,023	923
6	Conservation-Ecology Issues	3,840	3,418	2,127	768
7	Natural History Topics (geology, weather, etc.)	3,271	80	2,167	894
8	Arts, Crafts and Hobbies	2,501	2,415	2,697	1,786
9	Motorboating	2,404	1,941	2,602	2,492
10	Trapping Furbearers	2,051	1,849	2,483	2,756
11	Nonconsumptive Outdoor Sports (canoeing, hiking, etc.)	1,935	2,331	3,162	1,913

Booze And Boats Don't Mix

BOOZE AND BOATS don't mix. That's one very obvious finding in a report on North Carolina's fatal boating accidents conducted by the N.C. Wildlife Resources Commission's Division of Boating.

One out of three victims of boating accidents tested had at least a .10 blood alcohol level. Anyone operating a vehicle on a highway with a .10 or greater blood alcohol level is considered to be driving under the influence.

The loss of coordination and balance resulting from excessive drinking can be especially dangerous on the water. In an emergency situation, such as a capsizing, alcohol impedes a person's ability to react properly. It also reduces survival time in the water by increasing the rate of the body's heat loss. According to the study, 50 lives were lost in boating accidents in the State in 1978.

The major causes of fatal boating accidents on North Carolina waters in 1978 were as follows:

— Anchoring the boat from the stern or letting the stern of the boat face oncoming waves.

— Sudden movements, especially in small boats. An example would be someone standing up and falling overboard or capsizing the boat.

— Operator carelessness resulting in the operator getting into a dangerous situation before he realizes it.

— Disregard of weather conditions.

The study also found that many lives were saved by wearing personal flotation devices and staying with a capsized boat instead of trying to swim to shore.

Sea Grant Offers Free Publications

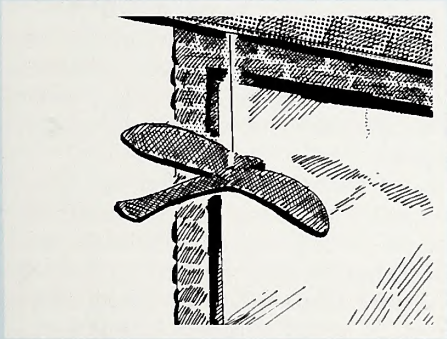
SURF FISHERMEN, BEACHCOMBERS, seafood fanciers and other saline types might want to take a gander at two new publications available from the N.C. Sea Grant program. The publications are as follows:

"Wreck Diving In North Carolina" (UNC-SG-78-13) is a directory of shipwrecks found along North Carolina's coast.

"Storms, People and Property In Coastal North Carolina" (UNC-SG-78-15) contains historical and meteorological data on North Carolina's major coastal storms. It includes tips on how to act safely and survive a major storm.

Both of these publications may be obtained free by writing to the North Carolina Sea Grant Program, North Carolina State University, 1911 Building, Raleigh, N.C. 27650.

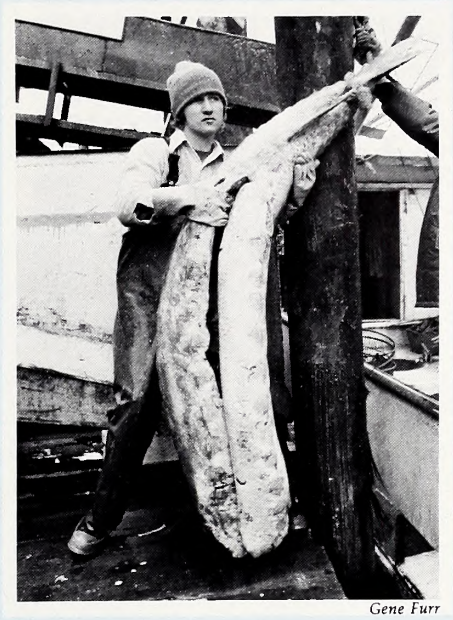
Hawk Cutouts Protect Birds



LARGE PICTURE WINDOWS which reflect trees and other natural vegetation often cause songbirds quite a problem. The birds apparently can't tell the difference between the wide open spaces and the window reflection, and are injured or killed when they fly full tilt into the expanse of glass.

A simple device to help minimize this is suggested by Mr. Pressley R. Rankin, Jr. of Ellerbe. Rankin suggests that a hawk silhouette, cut from masonite or light plywood and painted black or dark brown, be hung with light string or nylon beneath the roof overhang next to the problem window. The silhouette moves with the passing breezes and frightens the songbirds away.

Artificial Spawning May Hold Key For Sturgeon Populations



Gene Furr

BIOLOGISTS WITH THE U.S. Fish and Wildlife Service and the S.C. Wildlife and Marine Resources Department recently made fish culture history when, for the first time, they completed the hatching and spawning of Atlantic sturgeon artificially.

The development of artificial spawning techniques may make it possible to restore the Atlantic sturgeon and the endangered short-nose sturgeon.

Atlantic sturgeon were once very common along the eastern seaboard from the maritime provinces of Canada to Florida, but are now endangered throughout most of their range. During colonial times, huge sturgeon up to 18 feet long were caught, and 12-to 14-foot fish were not uncommon. The fish were in great demand in the last half of the 19th century. Sturgeon flesh was highly valued, caviar was made from the roe and the fish's swim bladder was converted into a high-grade isinglass. Heavy fishing pressure and the construction of dams which blocked spawning runs decimated sturgeon populations. Furthermore, rapidly increasing pollution also took its toll.

Today, the Atlantic sturgeon has been extirpated from most of its range, although a few fish are still found in the maritime provinces and in North and South Carolina. North Carolina's commercial catch in 1880 was 480,000 pounds. By 1975, the commercial catch had dropped to 45,000 pounds. In North Carolina, channelization, dredging and other forms of habitat destruction have reduced the aquatic life these fish feed on, and pollution has had a similar effect. Locks and dams placed on the upper Cape Fear river may have diminished spawning runs. The remaining small numbers of Atlantic sturgeon are found in the Pamlico and Albemarle sounds year-round, and also in the Neuse and Cape Fear rivers.

The short-nose sturgeon is similar to the Atlantic sturgeon but is much smaller. It rarely grows over three feet long and is endangered throughout its range. These fish are no longer found in North Carolina, victims of the same factors that caused the Atlantic sturgeon's decline.

Biologists hope to learn more about the needs and life habits of sturgeon, and may some day use the artificial spawning technique to restore the sturgeon throughout its former range.

February Enforcement Report

FOR THE MONTH of February, 1979, the N.C. Wildlife Resources Commission checked a total of 3,955 hunters and fishermen and 100 boaters.

Of the hunters and fishermen, 715 were prosecuted and 629 convictions were obtained. The total fines collected were $13,702 and the total costs collected were $12,987.

Of the boaters, 90 prosecutions were made and 71 convictions were obtained. Total fines collected were $215 and total costs collected were $1,624.

Other prosecutions totaled 23 and convictions totaled 21. Total fines collected were $215 and total costs collected were $1,624.

All fines and any arrests or witness fees are paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected are paid to the N.C. Wildlife Resources Commission or its personnel.

Off Road Vehicles Seriously Damage Public Land

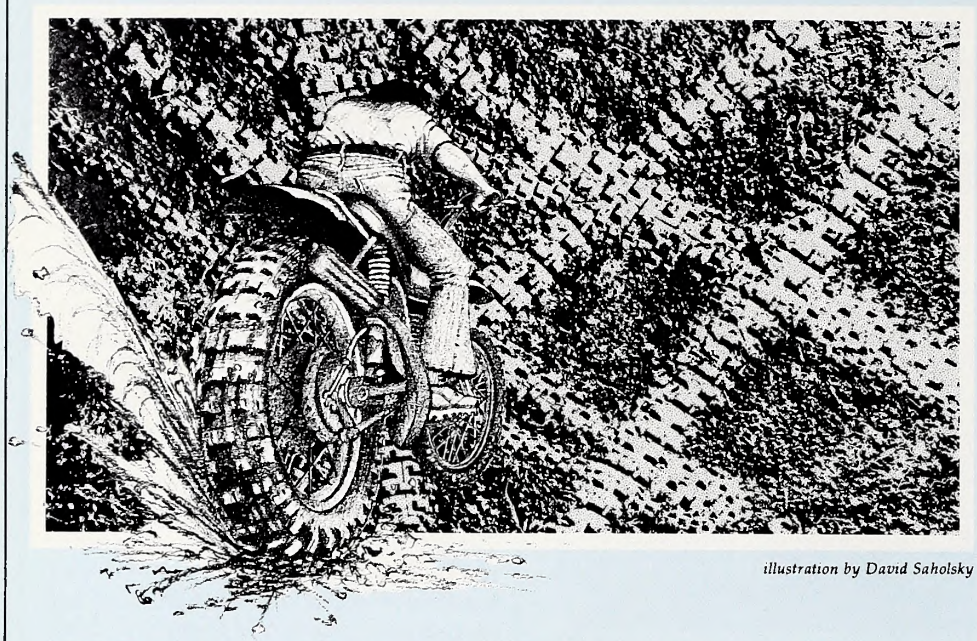


illustration by David Saholsky

ENVIRONMENTALISTS who don't like strip mining might want to turn some of their ire loose on the users of Off-road Recreation Vehicles (ORV's). In California alone, users of ORV's have denuded over one million acres of desert since 1968 according to the National Wildlife Federation. This is half as much land as strip miners have despoiled in over 150 years of digging.

Most of the desert lies in public domain and is managed by the Bureau of Land Management (BLM). Each weekend, thousands of ORV owners pour into the desert from adjacent Los Angeles and San Diego.

ORV use is creating a new dust bowl in these fragile regions. The desert soil is topped by a thin, brittle crust. Beneath this protective crust lies a very fine-grained soil. When the crust is broken, plants lose their anchor, reptiles lose their shelter, and the dust blows away in the ever-present wind. Soil scientists have found that a one-day motorcycle race may produce ten times as much airborne dust as a severe, natural desert sandstorm. In one race, monitored by BLM scientists, 600 tons of desert soil were sent swirling into the atmosphere. The soil loss has land managers worried because it takes 500 years to form one inch of desert topsoil.

ORV use also changes the nature of the desert. Plant life takes a beating in areas receiving heavy use. The dominant desert plants are usually crushed, and noxious "weed plants" take their place. Many desert plants, such as the creosote plant, live for over 600 years and may take 80 years to mature and reproduce. The pounding the desert takes from ORV tires also compresses the soil, making it harder for plants to become established.

Damage to the desert takes such a long time to heal that scars from General Patton's maneuvers in the Mojave Desert in southern California are still plainly visible. Wagon ruts made a century ago still crisscross the desert.

The California desert isn't the only place suffering from irresponsible ORV use. Land managers everywhere are struggling with the problems of erosion and stream siltation, washed-out or damaged roads, and disturbed wildlife. There have also been numerous conflicts between ORV users and those who use these areas with little or no adverse impact.

The problem is twofold. There has been a tremendous boom in ORV sales, and it is abundantly apparent that many ORV users have an irresponsible attitude towards the environment and the damage caused by their machines. Currently, there are about ten million ORV's in the country, including dune buggies, dirt bikes, snowmobiles and four-wheel drive vehicles. Movies like "Dirt" have popularized the image of ordinary people "busting loose" across sand dunes and deserts on dirt bikes and dune buggies. Almost invariably, the disastrous ecological consequences are played down. ORV manufacturers have contributed to the problem through advertisements which show vehicles tearing up pristine hillsides and crashing through streams.

Land managers feel that the solution to the problem is to restrict ORV use to certain areas. This will unquestionably destroy small tracts of land in a trade-off to preserve other areas. A better solution might be to bite the bullet and confine motorized vehicles to areas where they do little or no damage. In most cases, that would mean keeping them on the road.

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Nature's Ways

Ghost Of The Treetops

written and illustrated by Duane Raver

The chances are pretty good that you'll never see a flying squirrel. If you do, it probably will be one of those odd times when you're least expecting it. Perhaps one warm July evening when you're enjoying the first cooling breezes of dusk, a tiny furry blob may sail over the house and disappear in the gathering gloom. This may be as much as the flying squirrel will show you, for these are animals of the night, sleeping soundly all day in a tree hollow or remodeled grey squirrel nest, and emerging at dusk to feed and play.

Although there are thirteen described flying squirrels the world over, we have only two different varieties in North Carolina, and these are quite similar except for slight color variations. Just how extensive the range and populations might be for each species is a bit hard to say since they are so elusive and secretive. Basically, the northern flying squirrel is found in our northern counties, while the southern flying squirrel is restricted to the mountains of the State. There's bound to be an overlap, and it may be that most counties of the State have one or the other or both.

Its greatest claim to fame, of course, is its "flying ability;" and while this is a remarkable act of skill for a mammal, it really isn't flying at all. This little squirrel has loose folds of furred skin stretching between its front and back legs. When it spreads its legs wide, these membranes form "wings" of sorts. The flight is actually a glide from considerable heights and can cover fifty or more yards. Observations of captive squirrels reveal that they can turn at right angles from their line of flight during these glides and even depress or elevate the glide path to a modest extent. It's apparently a matter of manipulating the membrane, making it tighter or looser, for example.

There should be no mistaking a flying squirrel for any other aerial creature. There is no "wing flapping"; and except for a slight upswing at the end of the "flight" for landing purposes, the squirrel does not fly in an upward path.

Bats, of course, have wings of skin fashioned between "fingers"; and when the entire leg structure is moved up and down, actual powered flight is achieved.

The flying squirrel has large, light sensitive eyes which are apparently well adapted to night vision. It's doubtful that they catch insects during their gliding act, but certainly the ability to pick out objects in the gathering darkness helps with feeding. Long, sensitive whiskers may also be a help in detecting objects in the dark.

The fur is exceptionally soft and the tail is almost feather-like in its fluffy softness. This quality probably helps in streamlining the body,creating less friction in the glides than coarser textured hair. The whole body has a looseness about it that likely helps when inevitable falls occur. This suppleness also serves the little squirrel well in squeezing through the smallest of holes, often gaining access to areas where we would prefer they not enter.

There is little that can be done in the way of effective management to increase the flying squirrel population. Leaving dead trees here and there may help provide homes for a variety of wildlife, including flying squirrels. Nest boxes are sometimes used by the night-flying squirrels and are worth a try if you want to attempt enticing them to your yard.

The young, usually from two to six in a litter, are born in March or April. The nest is often an abandoned woodpecker cavity, or the flying squirrel may convert an old leaf nest built by a grey squirrel. They may create a problem by gaining access to attics or walls in dwellings, where they may nest, and their scurrying around at night is often mistakenly attributed to mice or rats. Food is usually nuts, fruits, insects; and on rare occasions, bird eggs or newly hatched young birds. Flying squirrels do little if any damage to other wildlife populations and seldom compete seriously with any other species.

Their greatest enemy is the house cat as it prowls the night hours. The great horned owl also snatches a few flying squirrels, but predation is usually not a serious problem. Several flying squirrels may gather together in a snug ball during the colder months and remain inactive for weeks at a time. But when summertime is at hand, the furry gliders enjoy the balmy nights. Listen carefully for their bird-like twitters and watch for their soft dives from the highest pines. This may be your night to see a flying squirrel.

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WILDLIFE IN NORTH CAROLINA

AUGUST 1979

Our Natural Heritage

by Jim Dean

Smoke In August

State Archives and History

In August, rural North Carolina is like a melon that is just short of being overripe. Driving down a country blacktop in late afternoon, there is a feeling of uncommon, almost oppressive lushness as though summer had bogged down for good in the heat. The air is thick and heavy with rich smells of honeysuckle, hog lots and fertilized crops ready for harvest.

There is yet another rich smell that carries with it the hint of fall, and you notice it as you pass the tall, windowless structures that dot the fields. It is the smell of tobacco curing in countless barns throughout much of the Piedmont and Coastal Plain. To many of us — even those who might never light a cigarette or cigar, stoke a pipe, take a chew or put a dip between cheek and gum — that smell is one of the most pleasant of all aromas.

Old log barns such as this one photographed in Caswell County in 1956 are becoming increasingly rare.

Regardless of any controversy over the use of tobacco, it is still an integral part of our natural heritage. There are too many of us who fondly recall muggy nights in August and September when we sat in the dust and listened to grandparents, parents and an assortment of farmhands as they swapped lies and tended the fires that fed heat into the flues to cure the bright leaf.

It was a 24-hour job, but it was not without its benefits. Sometime in the evening, there would be a trip to the nearby cornfield to gather an armload of ros'inears (roasting ears of corn for those who are culturally deprived). We'd peel back the shucks, remove the silk and any worms, then recover the corn with the shucks and put the ears in the ashes at the open end of the flue. No butter. No salt or pepper. We'd be picking corn out of our teeth for hours.

The age of flue-cured tobacco did not really get under way until after the War Between the States; however, some innovative farmers were using the technique as early as the 1820's. Until barns with flues were built, most tobacco was either air-cured or fire-cured. Open fires were actually built inside a barn on a sunken floor. As you might expect, this method required very careful attention, and sometimes the entire crop, as well as the barn, would be cured to ashes.

The idea of circulating heat through the barn in flues fed by fires from small rock or bricklined "fireplaces" that opened to the outside began to flourish only after the rise of Bright Tobacco. The last antebellum decade saw the discovery of this type of tobacco in Caswell County by Eli and Elisha Slade who raised a small crop on thin, sandy soil in 1852 or 1853. When cured, it had an unusual yellow color and brought fancy prices. At first, it was thought that peculiarities of crop management were responsible, but it was soon found that the chief factor was the soil, and the culture of this yellow tobacco soon spread into other favorable areas throughout the Piedmont portions of North Carolina and Virginia.

During the past 20 or 30 years, most of the old wood-fired tobacco barns have been converted to oil, and this development virtually eliminated the all night late summer ritual of tending fires. The newer method didn't require quite as much constant supervision. More recently, metal bulk barns have been rapidly replacing the older style barns.

Like many passing customs, the wood-fired tobacco barns were gone before we truly realized it. It seems only yesterday that these barns — many constructed of logs — were everywhere. Now most barns are covered with tin or tar paper, or even built of concrete blocks.

Someday, and perhaps not too far off, even these will pass into history; yet it seems hard to believe that these familiar landmarks may be as rare as peanut stacks.

WILDLIFE IN NORTH CAROLINA

"Wildlife in North Carolina" is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

August, 1979

Volume 43, No. 8

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Department of
Natural Resources and
Community Development

Howard N. Lee, Secretary

North Carolina Wildlife Resources Commission

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Many wild flowers are found along the Eno River which curls through the Piedmont northwest of Durham. This handsome example is lesser stitchwort *which is usually found in grassy places*

Back Cover *Photo by Ken Taylor*
The six-spotted fishing spider stands on the dimpled waters of the Eno River, one of countless interesting species of insects, plants and animals which still have a home because people cared enough to save a river.

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Ken Taylor

TO SAVE A RIVER

The Eno is one of the last wild rivers in the urban sprawl of the Piedmont, yet realists admit that the fight to save this river may never truly end.

by Mark Taylor

For years, the Eno was a river that time forgot. While Piedmont North Carolina boomed during the 1950s and 1960s, the Eno flowed around the outskirts of Durham unchanged. In a world of urban shopping centers, traffic snarls, factories and fast-food joints, the river was a cool, green oasis. Crumbling skeletons of old mills dotted its banks. Raccoons, opossums and squirrels found refuge in its lush bottomland forest. Hikers and bird watchers ventured down to the river, and an occasional fisherman stalked the pools and riffles for a chain pickerel or a nice plump redeye.

It was 1965. The whole Piedmont was booming, and all that good water in the Eno was going to waste.

For the city of Durham and many developers, the untouched Eno River was an irresistible bonanza, and a seemingly unending series of schemes were launched to tap the resource. For 13 precarious years, it seemed that the Eno would be dammed, polluted, developed and defiled — all for profit and progress. Had it not been for a dedicated group of conservationists called the Eno River Association, the river would unquestionably have undergone massive changes. Consider the major threats which were posed:

1965 — A large industry wants to come into Durham. Water is scarce, and the industry needs a lot of it. The proposed solution is for the city of Durham to dam the Eno and build a reservoir.

1966 — A developer wants to build a large apartment complex on the Eno near the old city pumping station.

1968 — The city of Durham proposes that a major beltline be built adjoining the Eno. This would give area residents an opportunity to "enjoy" the river.

1968 — A devastating drought strikes North Carolina, and the cry goes out for water. Chapel Hill wants water from Durham, and there is growing pressure to build the Eno Reservoir, now known as "Lake Eno."

1968 — Raleigh joins Chapel Hill in the clamor for Durham's water. The fight for the reservoir intensifies.

1970 — A large shopping center wants to locate on the banks of the Eno.

1971 — A proposed municipal sewer line would cross the Eno in 26 different places.

Duncan Heron

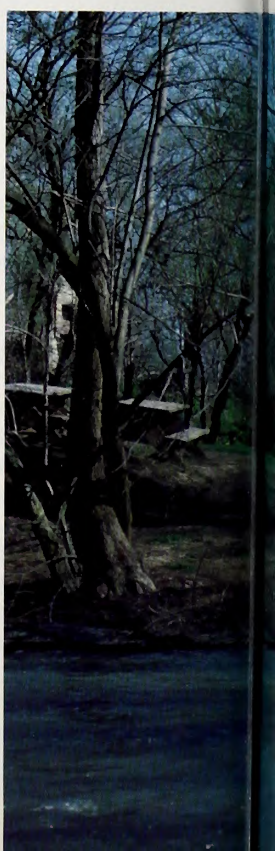
Duncan Heron

Dave Harris takes a kayak through the rapids at Cates Ford on the Eno (above). The Eno attracts many canoeists, especially during the winter months when the water is high. In spring and summer, a canopy of green is reflected in the more gentle waters of the river (above, left). Two girls and their horses enjoy a cool stop at Cates Ford.

"For 13 precarious years, it seemed that the Eno would be dammed, polluted, developed and defiled – all for profit and progress. Had it not been for a dedicated group of conservationists called the Eno River Association, the river would unquestionably have undergone massive changes."

When the original grist mill at West Point on the Eno washed away in a flood, the Eno River Association moved another mill onto the site and restored it. It was one of the main attractions at recent Folklife Festivals held here (left and below). Visitors are fascinated by the operation of the restored mill which is now in full working order grinding grain. Fishermen escape from the "grind" of everyday life by wading the Eno seeking sunfish, pickerel and the rather rare Roanoke bass which is native to this area.

Ken Taylor



1973 — A large municipal landfill is proposed on 155 acres of city land adjoining the Eno.

All these projects were defeated or modified as a result of efforts by the Eno River Association to protect the river. Perhaps you are wondering what sort of people make up the Eno River Association. How can these people successfully compete with politicians, state and federal agencies, and powerful industries? How could they possibly win?

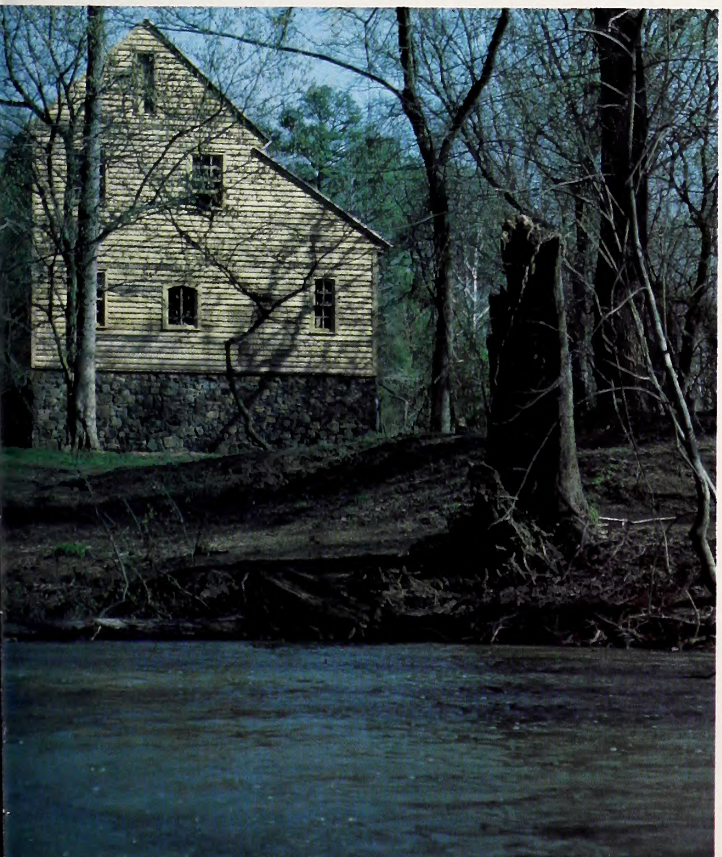
The Eno River Association is largely made up of local volunteers, and these fought for the river on two fronts. Obviously, there was an immediate need to stop those projects that would destroy the river. Equally important was the battle to get previously uninvolved people to appreciate the river and recognize it as an asset in its natural state.

"We started the association in 1965 when we first learned about the plans for a reservoir," said Margaret Nygard, one of the association's founders and perhaps the Eno's staunchest defender. "At first, our support came mostly from local landowners. We did a lot of digging and found out that the arguments justifying the proposed reservoir didn't stand up very well. A lawyer volunteered his time, and we were able to get the project stopped. We also came up with better water source alternatives of our own, using information obtained from the regional planning commission."

The battle to stop the Eno Reservoir took eight years, and the fight to get the public to recognize the river's intrinsic value also was no easy job. At first, the people who wanted to protect the river were considered "Rip Van Winkles." They were supposedly against progress, and by and large, were considered a negative group. It took a lot of work to change that image.

"There were two things we had to do to gain widespread public acceptance," said Nygard. "One was to come up with a positive plan for the Eno. The other was to get people out on the river so that they could see what we were fighting for."

Duncan Heron



The positive plan is an Eno River State Park, which will someday stretch for 20 miles along the river's edge, if all goes well. For the past 13 years, the association has been working with city officials, state and federal agencies, citizen's conservation organizations, and individual landowners to purchase land or obtain easements restricting development along the river. However, the work is still far from finished.

The Eno River Association also sponsored public hikes to introduce people to the river. The idea was to show some of the river's outstanding natural features on hikes guided by members of the organization.

"We were astounded when 200 people turned out for our first hike, and the following week we had 450 people show up," said Nygard. "We now sponsor nine winter hikes and 22 spring hikes, and they are still very popular.

"We consider the hikes to be one of our best weapons," she added. "Even the most callous politician changes his outlook after he's seen the river."

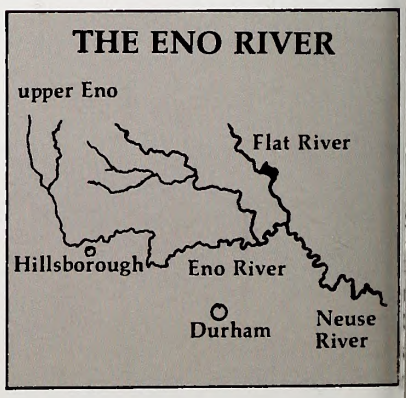
In addition to the hikes, the association also conducted a river clean-up campaign. For three weeks, association members, youth groups and other dedicated individuals pulled trash out of the river. The campaign won Durham a national "Keep America Beautiful Award" and a handful of association members and city officials flew to New York to accept the prize, an accomplishment that was not lost on the news media.

Ted Dossett

Duncan Heron

Helen Mary Johnson (left) admires trout lilies and bloodroot which bloom in early spring along the Eno River. The trails along the river are popular with hikers, and regularly scheduled hikes have been sponsored by the Eno River Association. This hike (right) took place on New Year's Day. Last July, the N.C. Folklife Festival was held at West Point on the Eno, and many people formerly unfamiliar with the river were attracted to the crafts, tours, and events which included outdoor bowling (below.)

Ken Taylor



"At first, the people who wanted to protect the river were considered 'Rip Van Winkles.' They were supposedly against progress, and by and large, were considered a negative group. It took a lot of work to change that image."

Duncan Heron

The local press was indispensable in the fight to save the Eno. In the beginning, the media was lukewarm at best to the association's aims. But when it became apparent what was at stake, articles and editorials began appearing in newspapers praising the association's efforts. Also, development plans for the Eno were questioned in print and on televisions.

One of the most successful projects the association engaged in was the creation of West Point on the Eno Park. The site contained an old grist mill and colonial farm. Since it was a historic site, the association obtained the support of the Daughters of the American Revolution, Daughters of the Confederacy, the Junior League, area women's clubs and other organizations. The original grist mill was washed out in a sudden freshet in 1973, but the association moved another mill to the site and restored it, along with the farm.

"Our efforts to save the historic landmarks on the river gave us a whole new audience," said Nygard. "Many of these people were not dyed-in-the-wool environmentalists; but when they saw the historical value of the river, they pitched in and supported us."

Ironically, the West Point on the Eno Park is now run by the city of Durham, and it has been the site of two annual North Carolina Folklife Festivals which drew thousands of people, not to mention increased support for preserving the river.

As you might expect, much of the battle for the Eno has been fought behind the scenes. Association members spoke to any organization that would listen, even though

"Hikes sponsored by the Eno River Association proved to be an effective weapon in gaining support for the river.

Duncan Heron

members sometimes felt they were walking into a lion's den. Many members also spent a lot of their own time and money fighting development projects, and everyone worked endlessly to gain public support for the river.

"No one person saved the Eno," admits Nygard. "It was the result of long hours put in by many people from all sorts of different backgrounds."

The approach used to save the Eno has been used successfully by other conservation organizations to save other rivers. The proposed impoundment on the New River was stopped by a coalition of environmentalists dedicated to saving that particular river. Indeed, the tactics used to save the Eno and New rivers provide a blueprint for those who seek to save any priceless natural area. Those who want to try to save their own favorite stretch of bright water should consider these steps:

— Appoint representatives from different environmental organizations to the "board" of your organization. The Sierra Club, Trout Unlimited, National Wildlife Federation, Audubon Society, Nature Conservancy and local canoe and hiking clubs offer good prospects.

— Sponsor "Fun" events to get people out on the river who normally wouldn't care about it. Hikes are a good

Duncan Heron

idea, as well as such events as flat water canoe races. Once people see how nice a river can be, you'll get converts.

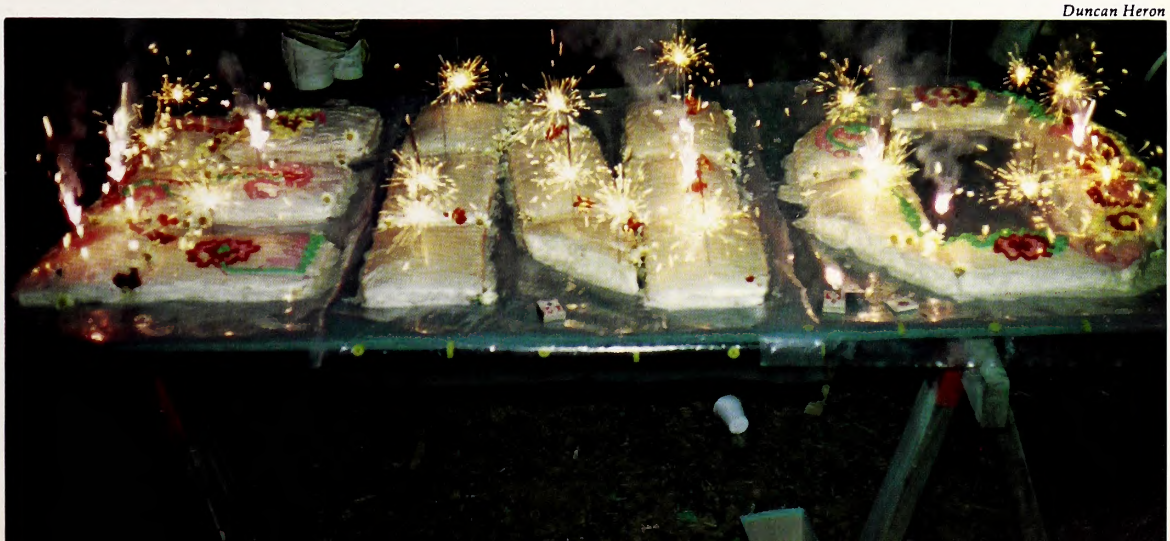
— Keep up with all developments or projects that can affect your river, and make your opinions heard when threats arise.

— Learn as much as possible about existing laws and regulations which protect the river. If development is not restricted along the river's banks, fight for zoning that will require a "greenbelt" along the water's edge.

— Never relax even when you think you're ahead of the game. The fight to save a river never stops (even the Eno is not absolutely safe forever).

The Rip Van Winkles can win. The only reason the story of the Eno River didn't end differently is because ordinary people cared enough to fight for what they believed in. Adopt a river. It can't have too many friends these days.

Duncan Heron



Margaret Nygard (above center) modestly refuses to accept credit for saving the river, yet her influence proved pivotal in the ultimate "team effort" success. Others, including George Pyne (top left), have led many hikes which turned doubters into converts. The "Eno" cake complete with sparklers celebrates one of the victories.

The Smallmouth Is Back

The smallmouth bass is making a comeback in Western North Carolina. Here's how and where to fish for these classic, cool water gamefish.

written and photographed by Curtis Wooten

At first, there was only a gentle tug on the end of my line; but when I set the hook, the fish surged away strongly and headed for deeper water. Then, it burst into the air in a twisting, turning frenzy and sent my lure cartwheeling half the distance back to me. I knew this was going to be a bass fishing trip I would long remember.

Mention bass fishing to most North Carolina fishermen and you're likely to spark mental images of huge lakes and swift boats in candy-flake colors with the angler sitting on a pedestal chair surrounded by sophisticated electronic gear and a tackle box overflowing with hundreds of lures. At the very least, there will be images of a favorite farm pond or a coastal river where old bigmouth lurks. In other words, for most of us, bass fishing means fishing for largemouth bass.

But there's another kind of bass fishing available to North Carolinians. It takes place in cascading streams on the slopes of the Blue Ridge, on the cool rivers in the shadow of the mountains and in several large highland reservoirs. This bass, of course, is the smallmouth. He's a smaller cousin of the largemouth; and in North Carolina, he's found only in the cool waters of the foothills and mountains. Though not as large, smallmouth bass are at least as scrappy as the largemouth and are a pure delight to the palate.

Over the years, smallmouth bass have been very popular with local anglers. They have also provided unexpected delight to visiting fishermen from other parts of the State who have caught them while fishing for trout.

Up until the mid-1950s, smallmouth waters throughout the foothills and mountain region saw heavy fishing pressure, and these fish provided some of the finest fishing experiences to be found in the State. Better roads improved access into and out of the mountains. Boat-

Most river smallmouth bass average about eight to 12 inches long, but they are a scrappy handful on light spinning tackle. Joe Mickey lands an average sized New River smallmouth on a float trip (right).

ing equipment became more portable, dependable and affordable, and the lure of lunker largemouth bass and stripers in lakes Norman or Hickory, or white bass in lakes James, Chatuge or Hiwassee were more than some smallmouth fishermen could resist. Many gave up stream fishing for smallmouth in favor of the variety and challenges that the lakes offered.

It is not incidental that land-use patterns in the watersheds that feed the smallmouth streams were also changing at about the same time. Much land was being converted from pasture to truck farming. The resulting runoff of silt from farmlands, construction sites and from gravel mining in streams adversely affected smallmouth reproduction. The result was a decline in the quality of fishing in many streams. The twin problems of lack of interest and a decline in stream quality persisted until the early 1970s.

In recent years, however, siltation and pollution control laws have helped clean up many streams. Much farmland in the west has been reconverted to pasture. Gravel mining in streams is under somewhat better control, and State sedimentation laws are helping to control at least some of the runoff from construction sites. Although there is still considerable room for improvement, many streams have recovered to the point that quality smallmouth fishing can

once again be regularly found.

In the past couple of years, fisheries biologists with the Wildlife Resources Commission have surveyed most smallmouth streams, particularly on the slopes of the Blue Ridge, and good smallmouth populations have been found in many streams. Even where siltation still limits reproduction, streams have been stocked with fingerling smallmouth if they are otherwise in good shape. Also, an expansion of the smallmouth stocking program has been planned, but a shortage of funds has forced a cutback. Still, the important point is that there are a lot of streams with good to excellent smallmouth fishing, and many streams could support a great deal more fishing pressure.

It was early on a sunny afternoon in late July when I had that first encounter with a smallmouth. Half an hour earlier, Joe Mickey, a Wildlife Commission fisheries biologist from Elkin, Joe Curtis, his summer assistant, and I had slipped our two canoes into the greenish-clear waters of the mountain river. Loaded with gear for an overnight stay, they were riding low in the sometimes shallow water and we wondered if we might have to walk part of the way downstream to our take-out point. A belted kingfisher, his blue feathers flashing, voiced his disapproval of our intrusion as we shoved off.

Action was slow for the first hour

or so, but we hardly noticed. We drifted lazily with the current, enjoying the sun and taking in a breathtaking view of river and mountains. The water under us whispered over boulders and down rock ledges as we gently steered the canoes, dropping silver Rapalas and spinners in the eddies behind rocks, under the brush along shore and in the deep water at the base of rock bluffs. We retrieved slowly, anticipating a strike at every twitch.

Occasionally, Joe Mickey would lift a 10-pound chunk of steel, attached by a rope to the stern of his canoe, and gently drop it over the side as we approached a likely looking hole. Thus anchored, he would fish every nook and cranny as the current carried my canoe past him. It didn't take long for me to notice that he was catching more fish.

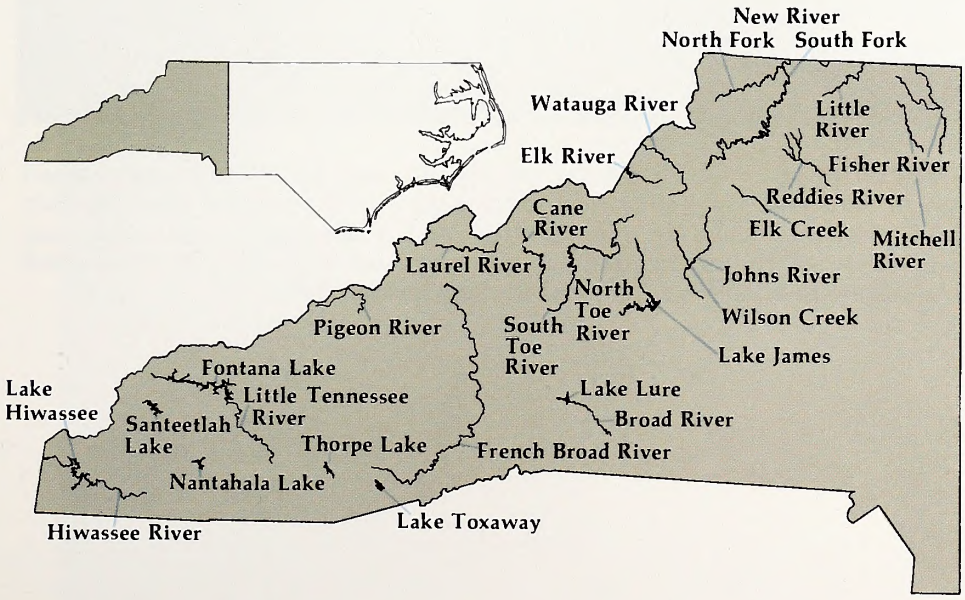
We knew when we planned our trip that smallmouth fishing was not at its peak. The best fishing generally is from late April until mid-June and again in September and October. That's usually when the record catches are made, both in size and numbers. Still, it's not difficult to catch fish on smallmouth streams throughout the summer. Even if the smallmouth are slow to strike, redeye (rock bass) are almost always hitting. Also, if you're high up the stream, it's not at all unusual to wrestle a scrappy smallmouth to net, only to find that a brown trout has given you a thrilling fight.

As the afternoon shadows covered the river, redeye began to hit almost anything that we threw at them, and we also began picking up eleven- and twelve-inch smallmouth bass. At dusk, we beached the canoes on a grassy spit and set up camp. An evening meal of crisply fried smallmouth bass with fried potatoes, cooked over an open fire, topped an almost perfect afternoon.

At dawn the following morning, heavy mist shrouded the river. The gentle gurgling of the water was muffled, the leaves on the trees did not rustle, and the birds did not stir. Only the raucous call of a distant crow and the occasional splash of a fish reentering the water infiltrated the silence. Donning wading sneakers, with rod and lure in hand, we entered the silent world, being careful not to trip, slip or splash for fear of breaking the spell.

The smallmouth were hitting. We netted and released several before

Smallmouth bass are found in many of the streams, rivers and lakes of western North Carolina. Some waters have better smallmouth bass populations than others, however, and a recent survey has pinpointed some of the best spots. You may need only an ultra-light spinning rod, a handful of small spinners and some felt-soled sneakers to wade some of the smaller creeks, while a canoe will come in handy on the larger rivers. On the big lakes, a bass boat is the ideal tool. Take a look at the smallmouth waters shown on this map, then give these scrappy bass a try. Some of this water is designated trout water, so be sure to have the proper trout license where this applies.



As the mist lifts off the New River in early morning, Joe Mickey lands a small bass on a spinner and light tackle. During the summer months when Michey and his companions made this float trip, most of the larger smallmouth bass were scarce. In the spring and fall, however, fish in the four to five pound class are occasionally caught, most of them on live bait.

the mist lifted. We broke camp and headed down the river.

Like most other fish, big smallmouth bass seem to be a bit finicky in the summer. While skilled anglers might land a four or five pounder occasionally in the spring and fall, most have to content themselves with much smaller fish in the summer.

Natural baits, such as minnows, worms and "lizards" (salamanders) seem to work best in summer, although many fish are caught on artificials. In the spring and fall, lures such as the Mepps shorty, 4-inch gold and silver Rapalas, the Honey B, various spinners and most any of the "natural look" lures are effective. Although I haven't tried it, I'm sure that fly fishing for smallmouth would put many fishermen in pure Heaven.

Some of the larger smallmouth streams can be easily fished from a canoe, but only if you know the waters. Many mountain streams have rather formidable rapids which can quickly turn a memorable fishing trip into one that is remembered for not-so-pleasant reasons. Believe me! If you are unfamiliar with a stream you plan to fish, be sure to find out if it has rapids before you launch your canoe. Ask the local people, check it out on a topographic map or do some scouting. Information on the canoeability of most smallmouth waters in North Carolina can be found in the book "Carolina Whitewater" by Bob Benner (published by Artcraft Press, and available from Pisgah Providers, Box 101, Morganton, N.C. 28655). It gives information on good put-in and take-out points as well as some pointers on what to expect in-between.

If, like me, you are a bit tired of being buzzed by water skiers on your favorite lake, you're probably ready for a river float for smallmouth bass. If you like solitude, clear water and breath-taking mountain vistas; or if you measure the success of your fishing trips not in the number or size of the fish you catch, but in the ability to simply spend some time leisurely fishing, then I know you're ready. Whether you use a canoe, or simply wade, fishing a river for smallmouth bass is a soul-washing experience.

Curtis Wooten is a frequent contributor to Wildlife in North Carolina.

Bear In The Air

By Rick Estes

Airplanes are the most effective tools available for nabbing game and fish law violators.

The message came in a crackle of static, "Three thirty three, come on." Following that short command, we started the engine and eased the patrol car out of the woods onto a dark, empty rural road.

"Take a right at the intersection and go two miles. You'll see the truck. They've been shining both sides of the road."

The terse voice on the two-way radio came from Ray Johnson who was high overhead in an airplane looking for night deer hunters.

I was sitting in the patrol car with two wildlife enforcement officers. We had seen no lights and heard no shots; but within five minutes after receiving the report on the radio, our officers were checking three men in a pickup for guns or other evidence of hunting.

Our car was one of four working an all-night deer hunting detail that covered parts of three eastern counties. Before we stopped the three men in the pickup, we watched them driving slowly along the gravel road shining a bright hand-held light over the fields, apparently looking for deer.

Before that fall night was over, fifteen people had been cited with various hunting violations. All were spotted from a Piper Super Cub airplane which most of them neither saw nor heard.

The Wildlife Resources Commission has been using aircraft

Ken Taylor

to check hunting and fishing activity almost since the Commission was created in 1947. According to Johnson, who is an assistant chief with the Commission's Division of Enforcement, airplanes are the most effective tools wildlife officers have in combating game and fish law violators.

He says, "Without the use of aircraft, the firelighting of deer in North Carolina would be out of control. There is no other way we can patrol the amount of territory that can be checked from the air."

Although the Commission's four Super Cubs are used extensively for finding night deer poachers, they are also used for many other purposes.

"Last year was the first year we used the aircraft to any significant degree to check trapping," Johnson said. "With one airplane and two officers in a car, we can check all the trapping in a county in a day. It would take fifty people to do that without the aircraft," he said. Johnson sees continued use of the aircraft for trapping surveillance because of present high fur prices and increased trapping activity.

Wildlife Commission planes are also used to check fishermen, boaters and small game hunters. Occasionally, sites for boating access areas are scouted by plane to determine their suitability and exact position in relation to the body of water and its surroundings.

Moreover, the "bear in the air" is also the wildlife manager and researcher in the air.

"Our aircraft are used by all the divisions of the Wildlife Commission in carrying out their different functions," Johnson explained. "We have helped the Division of Game track radio-equipped black bears, turkeys, and bobcats for various research projects. We have flown fingerling fish of different species to North Carolina from other states for research and stocking programs for the Division of Inland Fisheries, often getting them here quicker than they could be shipped by commercial airlines," he said. "On one such trip, one of our pilots brought 300 young flathead catfish here from Sulphur, Oklahoma, and got them here before the airlines could guarantee delivery. "We didn't lose a single fish."

In recent months, other State agencies have made use of Wildlife Commission planes for various inspection purposes. The Division of Earth Resources of the Department of Natural Resources and Community Development contracted for one of our planes and a pilot to help monitor mining activities across the State.

Airplanes are highly effective in

Ken Taylor

Most game and fish law violators have no idea how effective aircraft are in keeping tabs on illegal activities. An airplane in contact with wildlife enforcement officers in patrol cars on the ground can effectively cover vast sections of the State in a single mission. At night, pilots say they can not only see individual flashlights scanning fields for deer or other game, they can even spot the glow of a cigarette. Trained pilots quickly learn to differentiate between normal activity and that which is suspicious enough to warrant closer investigation by a ground or boat patrol.

enforcing the boating laws of the State. Aerial observers can easily spot careless or reckless boaters and no-wake zone violators on large inland lakes crowded with weekend pleasure seekers. "We are frequently asked to use our planes in cooperation with other law enforcement agencies to locate fugitives, downed aircraft, or lost hunters, fishermen, campers or hikers," Johnson said.

One of the most innovative uses of the airplanes has just begun. This involves air observations of the nesting activities of the Atlantic loggerhead turtle, a federally designated endangered species.

"In cooperation with the U.S. Fish and Wildlife Service and the Wildlife Commission's Interagency Coordination Section, one of our planes will fly over a selected section of the North Carolina coast, noting the points where female turtles have crawled up on the beach to lay their eggs. Officers on the ground will then locate the nest site and monitor the success of the nesting effort," Johnson said. "In this way, information on the loggerhead's current population and reproduction can be gained in an economical and effective manner."

Of course, the Commission's planes were originally purchased for law enforcement, and that is still their major function. Three wildlife enforcement officers are full-time pilots, and they fly details all over the State in conjunction with officers on ground patrol.

"The months of peak activity for our aircraft are October, November, December, and January," Johnson said. "This is the period of greatest hunting activity, both legal and illegal. However, we schedule flights throughout the year, both during the daytime and at night."

Sometimes wildlife officers using an aircraft will be looking for one type of illegal activity and find another. Johnson gave this example.

"On a recent airplane detail to look for illegal firelighting of deer, one of our officers, who was on his way to a stakeout location, saw a vehicle towing a boat towards a nearby stream. Since it was at about 7:00 p.m. in January, the officer suspected that something other than a fishing trip was planned. During the night, the airplane located the boat on the creek, periodically shining a light on the banks as it progressed downstream. At 4:00 that morning, when the fishermen were near the end of their trip, two wildlife enforcement officers checked them. They had killed two doe deer, six raccoons, and two wood ducks while floating down the stream."

Johnson maintains that this type activity is very difficult to check from the ground, but relatively easy to spot from the air.

"Many game law violators today carefully plan and coordinate their activities, often using CB radios to avoid detection," said Johnson. "If wildlife officers are to be effective in protecting our wildlife, our efforts have to be just as well organized, and the airplane is the best tool we have for coordinating effective enforcement of our game laws."

Letters

Dear Sir,

My husband and I would like to buy ginseng plants, and also become dealers. Also, we understand that there are laws and seasons concerning the harvest of ginseng. Is there someone we can contact who might be able to give us some information?

Mrs. Ann Parton
Bryson City

We have had several inquiries concerning ginseng following Doug Elliott's article "They Call It Green Gold," which appeared in the May issue of WILDLIFE IN NORTH CAROLINA. Al Elder has offered to answer any questions, and you can write him at the Pesticide and Plant Protection Division, N.C. Department of Agriculture, P.O. Box 27647, Raleigh, N.C. 27611.

Dear Sir,

For the past few years, I've noticed an increasing amount of abuse and irresponsible behavior on the part of four-wheel drive and off-road vehicle users. If we sportsmen expect private landowners, timber companies and land management agencies to keep their land open, we'll have to clean up our act and make sure we aren't part of the problem.

Last summer, I came upon one fool who had tried to run his truck over a closed logging road on a National Forest in the Mountains. After he slid off the road, he tore up a water bar to prop up his wheels with. The result will be a washed out road (one we paid for) because some guy didn't have enough ambition to take a hike. Roads don't drop out of the sky, they're built and maintained with taxpayers' dollars, so we shouldn't have to put up with this. What if there's a forest fire up there, and crews can't get in because the road's been ruined? I think you should address this problem in your magazine sometime.

Ed Landowski
Greensboro

Dear Sir,

Your April edition was excellent. After living in the N.C. mountains for a year, your magazine brings back a touch of "God's Country" monthly.

We do miss your beautiful state.

Mrs. Ron Tecza
Tampa, Florida

Dear Sir:

I was interested in the discussion of the mountain bogs in the June issue, and I hate to think of any type of habitat on the way out in North Carolina. Perhaps we can all be a little more aware of such fragile areas and strive to protect them a little better. By the way, although it wasn't specifically labeled, the illustration was of a bog turtle, wasn't it?

Sam Patterson
Winston-Salem

Yes, it was a bog turtle, which is on the rare and endangered species list in North Carolina.

Dear Sir:

As a farm pond owner, I can certainly echo most of Paul Koepke's statements about the management of these tricky little waters. They vary so much from one end of the State to the other, that I doubt if any sort of precise management plan can be generalized, and each one must be dealt with individually. I once heard a fish biologist say that he'd never own a farm pond because he wouldn't know how to manage it, and he had looked at hundreds over the State. One thing might need underlining, and that is the element of fertilizing the pond. While many need it, quite a few might not, and some will actually be harmed by it. Fertilization is not a cure-all by any means, and some professional advice should be sought and followed before dumping in pond fertilizer.

Scott Haswell
Greensboro

Dear Sir:

We enjoy WILDLIFE IN NORTH CAROLINA very much, and thought Pete Elkins' article on jigging for stripers in the June issue was excellent. Where can I buy his book, "Catching Freshwater Striped Bass"?

Clyde Williams
Durham

Pete Elkins' "Catching Freshwater Striped Bass" is published by EPM Publications, 1003 Turkey Run Rd., McLean, Virginia 22101 for $9.95.

Dear Sir,

I am writing to compliment you on your excellent magazine, WILDLIFE IN NORTH CAROLINA. I grew up near Belmont, N.C. My parents still live there and gave me a subscription as a gift. Many of your articles are of interest to out-of-staters. The quality of materials, printing, and photographs in your magazine are unequaled. The article "An Obsession With Trout" in the May issue was one of the best I've read in a long time. Keep up the good work!

M.A. Bowen
Chelsea, Michigan

Dear Sir,

I have just completed reading WILDLIFE IN NORTH CAROLINA for June, and I felt I had to write and compliment you on the photography which accompanied the striped bass article. They looked so real it made you feel as though you could reach out and touch them.

I have been a subscriber to WILDLIFE IN NORTH CAROLINA since 1952, and the magazine continues to improve in quality each year. The beautiful photographs and fine articles about all outdoor subjects printed on slick, bright paper make this the number one (1) magazine that I receive, and I receive 14 magazines each month about outdoors, hunting and fishing.

I have 95% of the issues since 1952 and enjoy looking back through them and comparing things through the last twenty-seven years.

Keep up the good work and don't change a fine magazine.

M. Dexter Brown, Jr.
Walnut Cove

Dear Sir,

Is there someone on your staff who can tell me what the liquid is in the bottles illustrating the ginseng article.

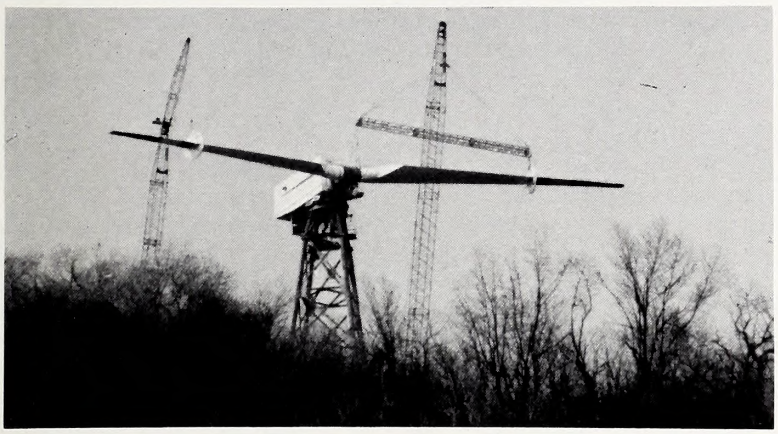
Obviously, the leaves of the ginseng plant as well as the roots have been put in the bottle but I would like to determine what liquid is added to make Clyde Hollifield's homemade ginseng tonic. Your assistance would be greatly appreciated.

Robert M. Senn, Jr.
Greensboro

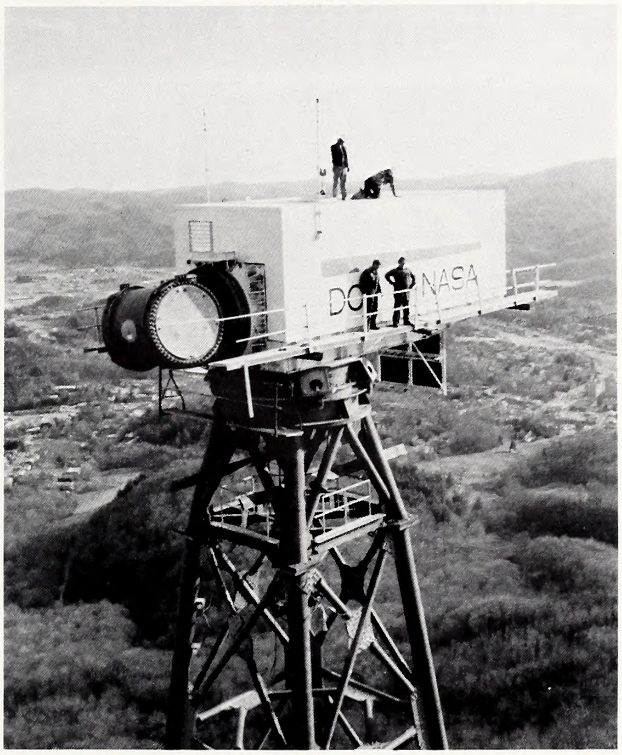
We understand that the traditional liquid used to soak ginseng is white lightning, and while the homemade stuff is illegal, commercial products are available. This may help explain ginseng tonic's apparent rejuvenating effect — at least for a few hours.

Part of NASA Experiment!

World's Largest Windmill Now Operating In Boone



NASA



NASA

High atop a mountain overlooking Boone in western North Carolina, an experimental 240-foot tall windmill with two 100-foot blades can generate enough energy to maintain 500 homes.

Boone is not only the home of some fine mountain scenery, the town now boasts the world's largest operating wind-powered generator.

The windmill stands 240 feet tall, including the blades, and more closely resembles something out of Star Wars than a picturesque windmill. The slim, two-bladed prop — with each blade 100 feet long and weighing 20,000 pounds — will generate 2,000 kilowatts of electricity. That's enough energy to maintain 500 homes.

The electricity generated by the windmill will go into the Blue Ridge Electrical Membership Corporation's power grid. The windmill itself was built by the U.S. Department of Energy under the auspices of the National Aeronautics and Space Administration.

"We'll be conducting a lot of tests to determine the windmill's efficiency," said Marilyn Edwards of NASA's Public Information Office. "Right now, we're studying wind power very closely. In a year, we'll change the props and test a different design to see what's most efficient. We're also working with smaller windmills."

You have to go back to World War II to find a windmill similar to the one at Boone. Grandpa's Knob near Rutland, Vermont, previously boasted the world's largest windmill. The Vermont mill produced 1,250 kilowatts of energy and had a slim two-bladed steel prop. The mill was built in the late 1930's by foresighted private entrepreneurs who figured that coal for power generation would be in short supply in the coming war and that most available electricity would go into the war effort. Their mill ran efficiently for the duration of the war, supplying most of the electricity needed to power the small city of Rutland. At the end of the war, the mill's prop broke and coal prices plummeted almost simultaneously. It was cheaper to generate electricity by burning coal and oil than to fix the reliable windmill.

The use of windmills to generate power, of one sort or another, goes back about 1,300 years to Persia. When Genghis Khan's hordes swept through Persia over 1,000 years ago, a point was made to capture millwrights and take them back to China where windmills still were, and are, extensively used.

The first man to generate electricity with a windmill was a Dane named LaCouer in 1890. Windmills in Denmark are still widely used for electric power generation. Danes remember that during the Nazi occupation in World War II their only electricity came from an extensive system of small windmills.

Under the NASA program, scientists are attempting to learn which areas are best suited for windmill generating plants as well as determine the best designs.

We're experimenting with small 200 kilowatt windmills along with the larger devices." said Edwards. "We're also finding areas especially suited for wind-powered electric generation on a large scale. A few of these spots include the Atlantic Coast off New England, the crests of many Appalachian mountains, the Great Lakes, the northern Great Plains, the desert of New Mexico, and the coast of the northwest."

What's important to scientists considering windmill sites is the consistency of reasonably strong winds, not the sheer power of an occasional storm. Scientists envision building giant windmill complexes offshore. These windmills would produce hydrogen from seawater through electrolysis, pipe the gas ashore, and burn it to generate electricity.

Windmills are even more practical now than they were in the past. Advances in metallurgy have overcome some of the problems that affected the Grandpa's Knob Mill, so chances are there will be more and larger windmills in our future.

Bluff Mountain Preserve Closer To A Reality

Hugh Morton

The North Carolina Nature Conservancy recently received a $75,000 grant from the James G. Hanes Memorial Foundation of Winston-Salem to help preserve Bluff Mountain in Ashe County as a nature preserve.

Bluff Mountain has long been regarded by conservationists as one of the most important natural areas in the State. The mountain contains 14 of the 15 plant communities found in the Appalachian Mountains and nearly 1,000 native plants. The only plant community lacking on Bluff Mountain is the arctic-tundra community that is found on some of the high Appalachian peaks in the northeast. Thirty-one plants that are considered threatened or endangered are native to the mountain, including one species of lichen which is found nowhere else in the world.

The Nature Conservancy estimates it will take $440,000 to complete the purchase of Bluff Mountain and to set up research and public education programs. To help, contact the N.C. Nature Conservancy, P.O. Box 805, Chapel Hill, North Carolina 27514.

Mattamuskeet Waterfowl Hunt Scheduled For Coming Fall

Limited duck hunting from preassigned blinds will be allowed at the Lake Mattamuskeet National Wildlife Refuge this fall for the first time since 1973. The plan will open 15 blinds to duck hunters for the first three weeks of the waterfowl season. The original plan proposed by the U.S. Fish and Wildlife Service called for 20 blinds to be open for the entire season.

"We modified our plan in response to public concern that hunting will scare Canada goose populations off the refuge," said Steve Frick, refuge manager. "Some people expressed concern at our public hearings that hunting would scare the geese. We don't believe this is so, but we plan to compare waterfowl use of the refuge during the hunt with use during the closed season."

Frick feels that the plan will have little, if any, adverse impact on Canada geese. Only ducks may be hunted while all Canada geese will be protected. Hunting will be allowed only from dawn until noon on four days of the week.

There will be a $10 charge for use of each blind per shooting day and the refuge will supply two dozen decoys with each blind. A maximum of three people will be allowed in each blind; the number of shells allowed in the blind will be restricted and only steel shot may be used. Hunters should apply for a permit for a blind, and will be assigned a blind and date to hunt following a public lottery. All of the blinds can be reached on foot.

"Like all wildlife management programs, the hunt will require constant evaluation," said Frick. "If we see that this is having an adverse impact on waterfowl populations using the refuge, we'd stop the hunt."

The hunt will open 4,000 acres of marsh and three miles of shoreline within the refuge to limited, controlled hunting. The entire refuge contains about 50,000 acres of marsh and 48 miles of shoreline. According to Frick, the hunt was proposed "in response to the increase in the numbers of ducks using the refuge in the past five years."

A public notice will be issued giving procedures and dates telling when and how the public can apply for a blind on the Mattamuskeet refuge. Watch your local newspapers for this information.

March-April Enforcement Reports

For the months of March and April, 1979, the N.C. Wildlife Resources Commission checked a total of 66,587 hunters and fishermen and 15, 292 boaters.

Of the hunters and fishermen, 1,671 were prosecuted and 1,426 convictions were obtained. The total fines collected were $30,346 and the total costs collected were $29,704.

Of the boaters, 317 prosecutions were made and 262 convictions were obtained. Total fines collected were $694 and total costs collected were $6,210.

Other prosecutions totaled 56 and convictions totaled 48. Total fines collected were $920 and total costs collected were $970.

All fines and any arrests or witness fees were paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected were paid to the N.C. Wildlife Resources Commission or its personnel.

N.C. Wildlife Commission Film Available

Movie buffs interested in wildlife will want to see the North Carolina Wildlife Commission's newest film, "Wildlife Horizons." The film was made by Ted Dossett, Bruce Craven and Ken Taylor of the Commission's Division of Information & Education (all three are also contributors to this magazine). The movie traces the history of the destruction of wildlife in America and North Carolina and shows how sportsmen and the Commission have successfully restored and maintained healthy wildlife populations in the State.

Copies of the film will be available to the public in early fall. For more information, contact the N.C. Wildlife Resources Commission, Division of Information & Education Films, 512 N. Salisbury St., Archdale Bldg., Raleigh NC 27611.

Leonard Lee Rue

Bald Eagles May Be Faring Much Better Than Expected

The bald eagle appears to be faring better than expected in the "lower 48," according to the National Wildlife Federation's first bald eagle census. The census was conducted during the first two weeks of this past January and turned up a total of 9,836 bald eagles. That's nearly twice the number counted in any previous survey of the endangered bird.

William Clark, director of the National Wildlife Federation's Raptor Information Center, attributed the high count to the intensity of the survey and to the fact that the "counters" were looking only for eagles. Previous surveys have been conducted by the U.S. Fish and Wildlife Service in conjunction with annual waterfowl surveys. The count conducted by the Fish and Wildlife Service last year turned up only 4,516 bald eagles in the "lower 48."

Clark says that most of the bald eagles counted in the National Wildlife Federation survey and in the Fish and Wildlife Service's surveys are "immigrants" fleeing Alaska's cold winters. Alaska has a summer bald eagle population of over 50,000 birds, and Canada's summer bald eagle population is estimated at 40,000 to 45,000 birds. When winter comes, many of these birds migrate to warmer areas throughout the United States. Clark estimates that the resident bald eagle population in the lower 48 states is around 5,000 birds, bringing the bald eagle's total population to around 100,000 birds.

Clark says that the new survey does not necessarily confirm that the bald eagle is making a comeback in the United States. "We haven't had good nationwide figures in the past," said Clark, "but this will allow us to establish a reference point, and future counts will show if the population is expanding or declining, as well as, show how birds are faring in particular areas."

Six bald eagles were reported in North Carolina in the count. Four of the birds were adults, and two were immature.

American Wood A Bargain!

If a trip to your local lumberyard leaves a cold wind blowing through your wallet, count your blessings. Wood in the United States is still far cheaper than it is in most places in the rest of the world.

If you lived in Pakistan, you'd pay double the price for a board foot of lumber. And if you were a typical Pakastani, you'd make about 1/11 of your average American salary.

If you lived in some west African cities, you'd spend a quarter of your income on firewood for cooking fuel. In India, you'd spend two days of each week scrambling around trying to find enough wood to cook with.

Maybe $25 for a sheet of plywood doesn't sound so bad after all.

In The Appalachians!

Wilderness Threatened By New Highways

The National Wildlife Federation has asked Congress to amend the Appalachian Regional Development Act (ARDA) to permit 13 Appalachian states to divert $300 million a year from "costly and destructive" highway construction into alternate transportation projects "more in line with the nation's energy and inflation problems."

"When the ARDA was passed in 1965 to aid the Appalachian states economically by improving access to the area, highway construction was an obvious choice," said Thomas L. Kimball, executive vice president of the NWF. "This road system is now 56 percent complete and has provided a valuable economic stimulus to the area. However, the remaining segments of the highway system will not only be the most difficult to construct, but will threaten destruction of scenic, recreational, and natural areas. As a result, industries in Appalachia which are based on tourism and recreation will also be threatened."

The areas which would be affected by completion of the highway system include bear and deer habitat in western Pennsylvania, Lake Chautauqua and the Allegheny River in New York, parts of the Monongahela National Forest in West Virginia, proposed wilderness areas and the Nantahala River in North Carolina, and several sections of the Appalachian Trail.

An amendment to the ARDA prepared by NWF and distributed to members of Congress would allow the transfer of funds equal to the estimated cost of finishing the highway system to other transportation projects within the Appalachian region.

Eligible alternative transportation projects spelled out in the proposed amendment include road resurfacing and rehabilitation, rail rehabilitation, airport development, rural public transportation, bikeways and bridge replacement.

"We Are All Consumers"

Wildlife Consumption — We All Play A Part!

illustration by David Saholsky

IN THE POPULAR MIND, if you hunt, trap or fish, you are a consumptive wildlife user; if you photograph, watch, paint or study wildlife, you are a nonconsumptive wildlife user. Not so, says Robert Weeden of the University of Alaska. He believes that there is no such thing as a nonconsumptive user of wildlife and he gives us some evidence to back up his argument:

"Item: A recent issue of *Audubon* magazine briefly tells of a new problem birds face: bird watchers armed with tape recorders. Want to add a rare bird to your life list? Get a recording of the bird's territorial call, march out into the springtime and play the tape loudly. An answer comes; you check off another bird on your list. Oops! Better check: it might have been another tape recorder. One pair of rare black hawks was disturbed so often by such nonconsumptive shenanigans that they failed to nest successfully in three consecutive years.

"Item: In 1975, scientists in Alaska 'collected' over 80 species of birds, fish of over 20 kinds, and 20 kinds of mammals. (Nobody kills wildlife: hunters 'harvest' it and scientists 'collect' it.) Among the birds killed were 70 black-footed kittiwakes, 110 tufted puffins, 224 redpolls, 23 savannah sparrows and 32 black-capped chickadees. Fish collections included 179,697 three-spined sticklebacks and 2,988 arctic char. Scientists reported taking and killing 1,046 tundra red-backed voles, 5 wolverines, 34 arctic ground squirrels and 6 arctic fox, among numerous other mammals. All very well-justified collections, I'm sure, and undoubtedly within sustained yield limits. But where is the distinction between scientist and hunter, in terms of consumption? The only difference is that scientists kill animals of more species, and more of them in breeding seasons than hunters.

"Item: Nonconsumptive users enjoying national parks and forests all over the world have trampled, eroded, and burned thousands of acres of green places and wildlife habitat.

"Item: Elementary and high school classes have all but stripped many California beaches bare of the bigger, easily found and colorful species of tidepool and beach animals."

Weeden feels we share the burden and responsibilities of being consumers in much more fundamental ways than the above leisure-time goofs. To-wit:

"Consider, for instance, the consumption involved in hunting moose, versus the consumption involved in eating the same amount of beef. The hunter eats no more meat than the average nonhunter, but he gets it from a different source. Nature produces moose without plowing ground, spreading fertilizers or spraying pesticides. The energy consumed in transporting a moose home is less than the energy cost of shipping a beef from Colorado to Chicago and up to Anchorage. Who is the consumptive user?

"We are all consumers of wildlife. I consume energy in flying to distant meetings and in heating my home, and that energy comes from strip-mined lands or oilfields and pipelines. I wear clothes made from wool (which commits wildlife forage to domestic sheep), cotton (which replaces oak-pine woodlands of the South) or polyester (which comes from coal or oil). In short, every human, by existing, consumes or displaces wild things."

To continue to make false distinctions between consumptive and nonconsumptive users is to play into the hand of those who don't give a damn about wildlife, says Weeden. There are only consumers who care, and consumers who don't care.

— Charles Hjelte
Colorado Outdoors

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Nature's Ways

Royalty In The River

written and illustrated by Duane Raver

What is so special about the smallmouth bass? To look at one on a stringer alongside a largemouth bass, you might find it difficult to tell one from the other. Yet, the debate goes on about the smallmouth's possible superiority as a game fish over its largemouth cousin.

There's no question about the smallmouth's above average habitat requirements, but this is not necessarily an advantage when it comes to survival. Largemouth bass seldom require anything more than a basic pond bottom on which to fan out a shallow, saucer-shaped nest. But the smallmouth must search out clean, coarse sand or gravel in reasonably clear water. If this combination of requirements isn't available, smallmouth production will be far below what it should be, and the population will suffer.

The smallmouth has an interesting spawning trait. The newly hatched young, which appear as tiny, coal-black specks hovering over a gravelly nest, seldom stay in a compact school more than a couple of days. Unlike the largemouth brood which is herded carefully by the male bass for more than a week, the smallmouth young scatter like wind-blown leaves.

If heavy silting occurs during the spawning period, there are additional serious problems in bringing a new crop of smallmouth into the world. Waters that provide good habitat the rest of the year may not be acceptable during the spring if runoff spreads over critical spawning areas.

Water temperature is another limiting factor in the world of the smallmouth. These fish simply don't do well in situations where the water reaches 85 degrees or higher and stays there for any length of time. It's probably this temperature factor that keeps the smallmouth on the west side of an invisible boundary extending approximately from Mount Airy through Hickory to Shelby. Scattered reports of the cool water bass have come from Piedmont North Carolina, but most have turned out to be fast-growing largemouths with disproportionately small heads.

Cool, clear streams seem to be the favorite habitat of the smallmouth, but many of the higher altitude reservoirs — Fontana, Hiwassee, Santeetlah — also have good populations of this great game fish. Smallmouth bass aren't designed for warm water lakes and ponds, and stocking in such habitat would be futile.

A few western North Carolina reservoirs have both largemouth and smallmouth bass in fishable numbers, and it's not unusual to catch one of each on successive casts along a rocky shoreline. The food habits of the two are fairly similar, both fish being opportunists ready to snatch just about anything they think they can tackle. Both species can also be moody and completely close-mouthed about any feeding. Generally speaking, the smallmouth is the more difficult of the two to catch, and is less predictable than his largemouth cousin.

Perhaps the smallmouth enjoys too much "royalty" status, but these fish are fine game fish, and they live in a beautiful habitat that is quite fragile.

Eight-Legged Angler

Some spiders, like this large six-spotted fishing spider, live in or near water and capture small insects and occasionally tadpoles and small fish. Photographer Ken Taylor found this one resting in the shallows of the Eno River while shooting photographs for the article on page 2 inside.

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WILDLIFE IN NORTH CAROLINA

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Our Natural Heritage

by Jim Dean

The Crisis In Adventure

You can put a price on real estate. The Blue Book will tell you the eroded value of that gas guzzler you're piloting back and forth to work. Undoubtedly, a buyer could be found for your aunt's collection of antique butter molds.

Indeed, almost everything has a price — everything that is except those things which are most dear to us. For example, those who cherish the outdoors and find a renewal of spirit in the remaining wild areas have noticed some disheartening trends in recent years. To put it bluntly, it's virtually impossible to intentionally get lost anymore. That's not a joke, unfortunately. It's difficult to find a place that is so remote that it evokes the thrill of adventure or excitement of exploration. We're suffering from a crisis in adventure. Where is that tingle that comes from the knowledge that you are 20 miles from a paved road in the midst of a delicious solitude shared with no other humans? What has happened to the jumping off places, and the uncharted lands and waters that lay beyond them?

It seems but a few years ago — not more than 10 or 15 — that you could plan a trip to the eastern or western part of this State and wind up happily in the middle of nowhere. Nor would there be several thousand other wilderness hungry fellow citizens sharing your discovery.

There are countless examples, but a few will do. Just a few years ago, a hiker on the Appalachian Trail and other western trails looked forward to meeting another hiker after spending several days walking alone on the mountaintops. Now, if you manage to get out of sight of another group of hikers for more than 30 minutes, you count yourself lucky. A trip into Linville Gorge was a daring undertaking, but no more. People wander up and down the Gorge as though it were a shopping mall.

Campgrounds throughout the west are crowded, and even the trails and rivers that were once rarely visited have been discovered. A dozen years ago, I never saw a person or a footprint at one of the remote waterfalls where I sometimes fish. Two years ago, I took my son to see it and we ran into a score of hikers, seven fishermen and 16 motorbikes.

The story is the same down east. Hatteras and Ocracoke are often crowded even past the warm vacation months. Bass fishermen on eastern rivers — especially the Chowan — complain that they cannot escape their own brother anglers; yet 10 years ago, it was uncommon to see more than two or three other boats during a day of fishing.

Not so many years ago, my grandfather used to lead the rest of the family on an annual summer trek to a ramshackle cabin built out over a marsh in the Little Alligator River. It was a true safari in every sense of the word. In my memory, Columbia was the jumping off point; and from there to Fort Landing, the road became increasingly poor with the swamp encroaching on every side. On the map, the few roads in this part of the State were thin ribbons through the wilderness.

The last three miles of our trip was via juniper skiff over the foam streaked chop of the Alligator. By the time we had shot our way past the cottonmouth moccasins to get into the cabin, we felt like ivory traders in the headwaters of the Congo. It was wonderful.

Many of these swamps are gone now, victims of massive farming operations. Columbia is still a fine town, and Fort Landing and the Little Alligator are still there, but much of the wilderness that gave this country its distinction is gone. Also, there are many more boaters, fishermen and pleasure seekers. These changes have resulted in a lost sense of adventure for those who travel here, and this is happening throughout the State.

Perhaps you will say that this is sour grapes, and certainly I agree that this must sound rather selfish. Even so, my purpose is simply to point out how much things seem to have changed in this State in the past few years.

Not all the news is bad, however. Along with this loss of solitude has come a beneficial wave of environmental awareness. People care what happens to our remaining wild areas; and because of this, it is much more difficult for vested interests — public or private — to destroy them.

It's a tradeoff that had to be made, and I think we'd all agree that we'd rather share the wilderness than lose it. Still, it's only human nature to look back nostalgically to the recent past when all of it was just yours and mine.

WILDLIFE IN NORTH CAROLINA

"Wildlife in North Carolina" is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

September, 1979

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Front Cover *Photographer Curtis Wooten captured this delicate scene early one morning while droplets still clung to the grass and fallen leaves.*

Back Cover *A brilliant red maple stands in stark contrast to the bright green needles of a pine. The photograph is by Curtis Wooten.*

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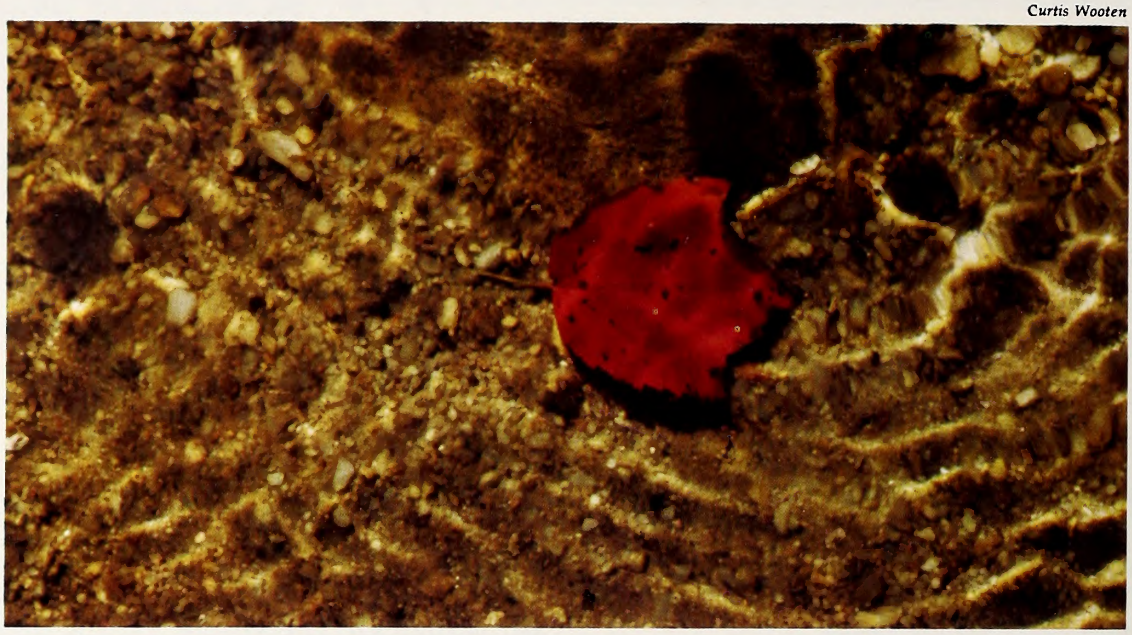
Curtis Wooten



MIRACLES CALLED TREES

In a world full of wonder, trees are among the most fascinating and useful; yet few people truly understand how they grow and function.

By Curtis Wooten

Trees! We see them daily, lounge in their shade, hear the rustle of their leaves and take them very much for granted. Like the air, they are always there.

They beautify the landscape, hold back and cycle the waters that fall from the heavens, replenish our oxygen supply, cool the air, slow the wind, house the birds that soar above them and the animals that walk, crawl and slither on the cool moist earth at their base. They create a suitable environment for understory trees, shrubs, ferns, mosses, mushrooms and fungi and for the almost infinite number of organisms that inhabit the soil beneath them. They produce food and fiber for mankind and provide solitude and solace to rejuvenate the spirit.

But how do they grow and function? Where and how do they get their water and nutrients? What enables some to withstand the force of hurricanes while others topple in summer storms? Surely a close look would tell us.

As recently as 300 years ago scientists were mystified about the raw materials used by a tree in its growth. It was at that time that a Dutch physician, J.B. van Helmont, conducted an enterprising experiment that helped solve the mystery. One spring he planted a willow weighing five pounds in a barrel containing 200 pounds of soil. After five years of patient watering and care, he carefully removed the tree and its roots from the barrel and weighed them. He found that his five pound sapling had grown to a 169-pound, three-ounce tree. Somewhat to his amazement, when he weighed the soil in the barrel, he found that it had lost only two ounces in weight. It was obvious that the tree's bulk had not come from the soil, except for the two ounces (which it is now known were mineral elements essential to the tree). Somehow, the tree had manufactured its growth from the water he gave it. More sophisticated experiments conducted since then have shown that trees, and all other green plants, take carbon dioxide from the air and combine it with water in the presence of light to produce simple sugars. These sugars are used by the plant for growth.

The chemical reaction that produces the simple sugars takes place in chlorophyll-containing bodies called chloroplasts, more than a hundred of which may be present in a single photosynthetic cell. There are hundreds of thousands of cells in a single leaf and a single maple tree in fall foliage may have 300,000 or more leaves. That's a lot of leaves, but it seemed like even more when I raked those that fell from the trees in my yard last fall.

Water is a high-demand commodity for trees. That's partially because trees use water in the manufacture of their food, but also because — somewhat like the American motorist with gasoline — trees aren't very conservative in their use of it. In fact, they're downright wasteful. It takes only about 100 pounds of water for a tree to produce 55 pounds of cellulose, the main component of wood, but during the process, the tree may lose over 100,000 pounds of water by evaporation from the surface of its leaves. That creates

S. Bruce Craven

For all the beauty displayed by ice-locked pine needles, the bark of a river birch or the graceful crown of an oak, trees also serve countless useful purposes. They prevent erosion, refurbish soil, act as windbreaks, yield food and cover for wildlife, and provide mankind with building materials, medicines and fuel. Trees may be our most important renewable resource.

Ken Taylor

Ken Taylor

Ken Taylor

a supply problem for the tree, but that excess water plays a vital role in the survival of many creatures, including man.

It was at an early age that I discovered that the coolest place around on a sweltering August afternoon was in the shade of a tree, and I made every effort to spend as much time there as possible. But it wasn't until fairly recently that I learned why it's always cooler under a tree than under other structures that similarly shade the sun.

A gnarled old oak, which may have well over half a million leaves, can lose as much as 1,000 gallons of water a day to evaporation through the same process used by air conditioners to lower temperatures. The efficiency of air conditioners is measured in BTU's (the amount or absence of heat required to raise or lower one pound of water one degree in temperature). That same old oak that so pleases the eye and provides nuts for umpteen dozen squirrels also produces the effect of more than a million BTU's, or the air cooling effect equal to a hundred or more air conditioners. What's more the high humidity climate created by evaporation and the moisture retention of a forest creates a moist environment suitable for the growth of thousands of understory trees, shrubs, ferns, mosses, lichens, fungi, insects, mammals and birds that live in and sustain the forest.

The water supply problem of trees is everpresent, but trees have evolved extensive and often unique root systems to meet those problems. Those that grow in wet areas, like the willow, have shallow fibrous roots running close to the surface. They are effective at gathering water and nutrients but, sad to say, they don't provide much stability and the trees often topple in summer storms. Others, like the pine which often grows in relatively dry soils, have a long tap root that plunges deep in search of water and nutrients. The tap root also acts as an anchor, holding the tree steady in high winds. Still others, like the walnut and hickory, have both an extensive fibrous root system near the surface and a tap root to "tap" the resources deep in the earth. Such root systems provide additional stability in heavy winds.

Like space, it is difficult for the mind to fathom the complexity of the root system of the average tree. One has never been completely measured and probably never will. Some years ago, however, an enterprising researcher at a midwestern university undertook the task of studying the root system of a single rye plant, and although the root systems are different, a comparison might be made.

At the end of four months, he found that the plant had grown over 378 miles of roots for an average of over three miles of new growth each day. Using that as a model, one can only wonder about the immensity of the root system of a 200 year old Carolina hemlock that stands nearly 100-feet tall. Most of us never see the roots of a tree. We are more likely to be impressed by the trunk which rises from the ground like a massive pillar.

Tree trunks follow one of two basic patterns. Some, like the pines and hemlocks, rise straight from ground to topmost twig with horizontal branches that get progressively shorter near the

Each tree has distinctive leaves. The pale green leaves of the chestnut oak (below) are not at all like the leaves of the pink flowering dogwood (right). The four "petals" of the dogwood are actually modified leaves, while the true flower is the small, compact head in the center of these petals.

Ken Taylor

top. Others, like the apple and willow, divide and redivide, forming a broad canopy of densely woven branches. Still others, like a maple, can have either type, depending on whether it grows on an open hillside or is competing for sunlight in a dense forest.

Whatever its form, a tree's trunk serves two purposes. It holds the leaves up to the sunlight and conveys water and nutrients to the leaves. The food generated by the leaves is then sent to all other parts of the tree.

In most cases, a tree growing in full sunlight tends to have a short and stocky trunk with a crown that's full and bushy. There is a tendency for the tree to spread out rather than grow tall. But if the tree is growing in a forest where competition for light is keen, the trunk is most often long and straight and the crown is much smaller. The reason is the presence of a hormone, known as auxin, that stimulates growth. This hormone is found in all plants, and is the same substance that makes the plants placed on your kitchen sill turn toward light. It is also the substance that makes the 300,000 or so leaves on your average maple tree manipulate themselves such that there is a minimum of shading of each and every leaf by another.

What happens is that light reduces the concentration of auxin on the bright side of the stem. As a result, the dark side, which has more auxin, grows more rapidly, bending the stem toward the light. Similarly, when a leaf stalk is shaded completely, the amount of auxin increases and growth occurs, pushing and bending the leaf until it is again in the light. Once in the light, there is a reduction of auxin and growth halts.

Everyone knows that the inspection of a freshly cut tree stump reveals a series of light and dark rings, which if counted, reveal the age of the tree. I think it's one of the first things that kids are taught — right after they learn to walk. On the other hand, occasionally you'll run across someone who doesn't know that the reason for those dark and light rings is the difference in the growth rates of the tree during the spring and summer. For example, I once thought that the light colored ring of wood was laid down in the summer and the thinner dark ring represented the period of no growth in the winter. Not so. The tissue that adds to a tree's size from year to year is confined to a microscopically thin layer (the cambium) found just under the bark. As the cambium cells divide, the tree grows in diameter. The new cells formed toward the inside of the tree become wood and those on the outside become a layer called phloem. Wood cells produced in the spring growing season are usually much larger than those produced in the summer. Because the wood they produce is less dense, they appear lighter in color. The small size and higher density of the wood cells produced in the summer make them appear darker. It is this alternation of the dark summer wood with the lighter colored wood produced during the following spring which creates the rings in tree trunks.

Although the wood of a tree is "dead" in the sense that it cannot divide to form new cells, it continues to perform valuable functions for the

Ken Taylor

Curtis Wooten

From the rich forests of the high mountains (left) to the swamps of the Coastal Plain (below), North Carolina is blessed with more different species of trees than virtually any place on earth. While many of these species are barely known to most laymen, others like the black walnut (nuts and leaves at right) have become so valuable in the manufacture of furniture and high quality veneers that a single mature tree might be worth thousands of dollars.

Ken Taylor

Ken Taylor

tree for several years. It pipes water and nutrients back and forth, stores food and supports the leaves. But with age, the inner parts of the tree quit working altogether. As tissues and cells clog with gums and resins, the wood turns dark in color. This inner dark wood is called heartwood and is highly prized by man for its density and durability. To the tree, however, it serves no useful purpose other than support. In fact, a mature tree can live just as well without it, which accounts for the fact that hollow trees seem most often to be as healthy as those with solid centers.

While a tree can live without its heart, it cannot long survive without that thin layer of tissue between the cambium layer and the bark known as phloem. For several years after it is formed, sieve tubes in the phloem carry food manufactured in the leaves to all parts of the tree. As the phloem grows, it is eventually cut off from the water and food inside the tree, and begins to die. Thus, some of the phloem helps form the protective outer bark.

As an impressionable youngster, I recall watching a neighbor girdle a tree and wondering how something so massive could be killed by simply cutting away a band of its bark around the trunk. Not wanting to hurt my neighbor's feelings, I kept the feeling that it would never work to myself. But in a few days, the leaves had begun to wilt and a few weeks later, they had turned brown and were falling. What he had done was remove a band of phloem (which carries food from the leaves to the roots and other parts of the tree) as well as the cambium layer which conducts growth. Although everything was in working order in the top of the tree and the roots were in good shape, the vital connecting link had been broken. The tree died. The effect is the same whether the girdling is done by man, animal or insect.

Obviously, you can't have a forest without trees, but trees don't necessarily make a forest. Every forest is the outcome of an intricate chain of events in climate, earth history, soil development and many other factors. The arrangement of trees in any given forest is precise and follows laws of bewildering complexity. The forest swarms with insects, mammals, birds, reptiles and amphibians. Their numbers, under normal circumstances, are all in a delicate balance — tied by invisible threads of food, living conditions and mutual, but mindless, cooperation. This multitude of life does not live in the forest. It *is* the forest, as much as the trees themselves.

KINGS OF THE FOREST

There are 16 national champion trees in North Carolina.

By T.R. Hegele

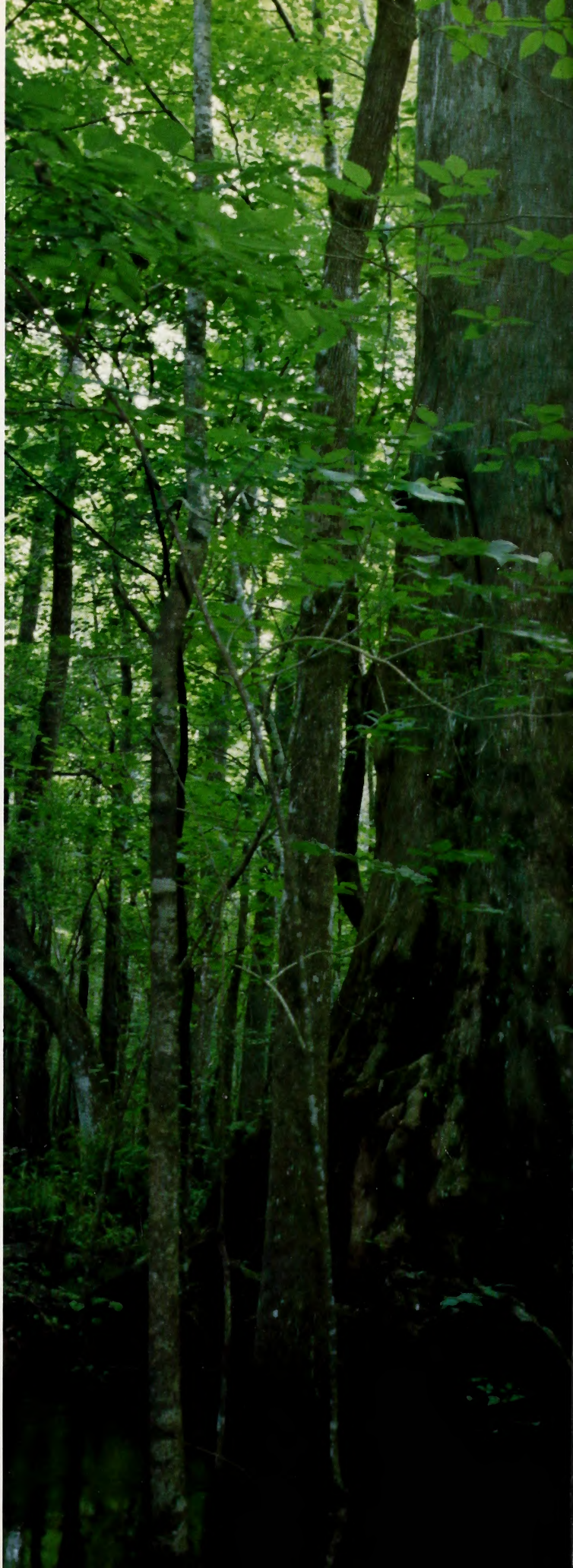
Imagine a big tree whose branches spread out to cover more than half an acre, or a tree that is taller than a 12-story building, or one so big that half a dozen big strapping rangers joining hands can't reach around it. These are not giant monsters growing in remote regions of the western United States. They are all Champion Big Trees growing right here in North Carolina.

North Carolina is the home of sixteen National Champion Big Trees, each one the largest of its species known to be growing in the United States. The North Carolina Register of Champion Big Trees lists 65 additional state champions, the largest of each of these species growing in the State.

The National Champion Beadle Oak, located in Hertford County, spreads its branches to cover an area 135-feet wide, shading about 23,000 square feet or more than half an acre. The State Champion White Oak in Caswell County will shade an area more than 140-feet across; but large as it is, this tree is well short of the national champion of the species which shades nearly three-quarters of an acre in Maryland.

Then there is the tallest known tree in the State, a 162-foot loblolly pine, which is also located in Hertford County. If you have trouble visualizing that height, a 12-story building with a flag pole on top would be just about as tall. A core sample taken from this national champion in the mid-1960's puts the tree's age at over 200 years, making it a "teenager" when our nation was born.

But if size is any indication of age, and it frequently is, this loblolly pine is an infant when compared with the National Co-Champion bald cypress in Bertie County. This monarch of the forest — more than 38-feet around at a point four and a half feet above its base — is only four points below its co-champion located in Tennessee and is unique for several reasons. One, it is the second largest living thing east of the Rocky Mountains and only seven other tree species in the United States are known to produce larger specimans, all of them being in Washington, Oregon and California.



The second reason this tree is unique is its age which has been estimated at upward of 2,000 years. Bald cypress are long lived trees to begin with, and this 138-foot tall skyscraper proves that point. It was old when the Roman Empire began its decline and was ancient when Columbus set sail for the unknown. Although its center has been eaten away by time and old age, the tree is still healthy and growing.

When it comes to determining a champion tree, size is relative. The smallest champion on the North Carolina Register is a southern crab apple with 95.7 points. That may not seem like much when compared with the 606 points for the bald cypress, but among southern crab apples, this Wake County tree is also a giant.

Champion trees are wherever you find them, and they are normally found by accident. Some are located well off the beaten track, like the champion sourwood in Graham County located several miles beyond the end of a rough jeep trail; or the champion red spruce in Swain County which is growing on the side of a mountain, 4,800 feet above sea level. It takes nearly all day just to hike to this tree.

Not all of our national champion trees grow in the remote swamps or steep mountains of the State, however. Some are literally as near as a person's front yard, like the cherrybark oak in Perquimans County and the southern magnolia in Bladen County.

Others are seen by hundreds of people everyday, most of whom don't even realize they are looking at a national champion big tree. Such is the case with the National Champion Fraser Fir located alongside the 18th green of a golf course in Jackson County.

Forests and trees have always played a big part in North Carolina's economy and make up a sizeable chunk of our environment. Being one of only five states in the nation with 20 million acres of commercial forest land — and since forestry is so important to the State — it seems only natural that a record of the biggest trees is being kept.

This magnificent Bertie County bald cypress (left) is approximately 2,000 years old and measures more than 38 feet around at a point four and a half feet above its base. It shares the national championship with a similar tree in Tennessee. The tallest known tree in the State is this national champion loblolly pine located in Hertford County (above). It is taller than a 12-story building.

photography by Ken Taylor

The national champion beadle oak (right) shades more than half an acre in Hertford County. Author Tom Hegele measures the trunk of an eastern hemlock (below which he and photographer Ken Taylor found at Linville Falls (left) while searching for the national champion Carolina hemlock. The Carolina hemlock has apparently fallen; however, this eastern hemlock may qualify as a new State champion.

Many states have a Champion Big Tree program similar to North Carolina's. The goal is to find the largest representative of each tree species growing within the state. There is also a National Big Tree program administered by the American Forestry Association in Washington, D.C.

The National Register of Champion Big Trees was first published in 1945 and listed 228 champions. The most recent National Register, published in April, 1978, con-

tains some 661 species; although more than 1,000 species are eligible for inclusion.

As of January, 1979, the North Carolina Register of Champion Big Trees listed 81 different State champions, 16 of which are also national champions. Since nearly 200 species are eligible to be on the register, our list is far from complete.

A champion big tree is not necessarily the one with the biggest trunk or the one that is the tallest. Champion trees are determined by using a formula that takes the tree's circumference measured in inches, added to the tree's height measured in feet, plus one-fourth of the average crown spread. The nominee of a given species with the most points is declared the champion.

Of course, it is important that the exact species of the tree be determined. White oaks compete against white oaks, longleaf pines against longleaf pines, and so on. Since only native or naturalized trees are eligible for champion tree status, the American Forestry Association and the N.C. Division of Forest Resources (which administers the program in North Carolina) have adopted the "Check List of Native and Naturalized Trees of the United States" as the guide to those trees eligible to be included. A "native" tree is one whose species is native to the United States, while a "naturalized" tree is one whose species was introduced into the United States from another country, but is now growing in a "natural" or "wild" state.

To most people a tree is a tree, but it can get confusing. A tree to some folks may be nothing more than big bush to others. To avoid confusion on this matter, the AFA and the North Carolina Big Tree programs have adopted the following as the definition of a tree: "A woody plant having one erect perennial stem or trunk at least 9½ inches in circumference at a point 4½ feet above the ground, a definitely formed crown of foliage and a height of 12 feet."

Now, armed with all this information and a tape measure, you can join the search for the biggest tree of the nearly 200 species of trees found in North Carolina. Nomination forms, complete with instructions on how to measure a potential champion, are available from any office of the Division of Forest Resources or by contacting the Division's office in Raleigh. If you have questions, or want a form, drop a card or letter to: Big Tree Search, Division of Forest Resources, PO Box 27687, Raleigh, North Carolina 27611.

Tom R. Hegele is fire prevention staff specialist for the North Carolina Forest Service, and maintains the records for the champion trees found in this State.

National Champion Big Trees Located In North Carolina

Because many of the National and State champion big trees are located on private land, we cannot provide the exact locations so that readers can go and look at them. This is unfortunate, but we are certain that you will understand why landowners who happen to have a champion tree in their yards or on their land would not want lots of folks wandering around at all hours. Also, it is a sad fact that vandalism — both to property and perhaps to a champion tree itself — could become a problem.

Common Name (Scientific name)	County	Year Listed	Circumference of trunk in inches (DBH)	Height in feet	Average Crown Spread Ft.
Bald Cypress* (Taxodium distichum)	Bertie	Jan. 1977	458.75 inches	138 feet	33.5 feet
Fraser Fir (Abies fraseri)	Jackson	Oct. 1969	98 inches	83 feet	48 feet
Carolina Hemlock (Tsuga caroliniana)	Burke	Nov. 1972	139 inches	88 feet	54 feet
Southern Magnolia (Magnolia grandiflora L.)	Bladen	Jan. 1979	243 inches	86 feet	96 feet
Beadle Oak (Quercus xbeadlei)	Hertford	Jan. 1977	206 inches	102 feet	135 feet
Bernard Oak (Quercus xbernardensis)	Wake	Nov. 1970	118 inches	78 feet	64 feet
Cherrybark Oak (Quercus falcata var. pagodaefolia Ell.)	Perquimans	July 1975	348 inches	120 feet	126 feet
Loblolly Pine * (Pinus taeda)	Hertford	Jan. 1975	173 inches	162 feet	73 feet
Pond Pine (Pinus serotina)	Scotland	Jan. 1977	114.6 inches	94 feet	46¼ feet
Shortleaf Pine * (Pinus echinata)	Mecklenburg	Jan. 1978	135.72 inches	115¼ feet	55.2 feet
Shortleaf Pine * (Pinus echinata)	Yadkin	July 1975	118 inches	130 feet	52 feet
Virginia Pine (Pinus virginiana)	Rutherford	April 1968	91½ inches	85 feet	53 feet
Allegheny Serviceberry (Amelanchier laevis)	Swain	Jan. 1970	73 inches	70 feet	44 feet
Sourwood (Oxydendrum arboreum L.)	Graham	July 1975	77 inches	118 feet	25 feet
Red Spruce (Picea rubens)	Swain	May 1965	165 inches	110 feet	50 feet
Florida Torreya Torreya taxifolia Arn.)	Warren	Nov. 1972	109 inches	45 feet	40 feet

* Co-Champions

Shooting Is A State of Mind

In trap and skeet shooting, mental attitude is more important than reflexes or eyesight. Expert Jack King tells you why.

By Rick Estes

When Jack King won the singles title at a trap shoot many years ago, he decided to go home without even entering any other events. Because of a change in the starting time for the doubles event — and because he had never shot doubles — he had no plans to enter.

"I don't even have a doubles gun," he told a friend who was urging him to enter. That sounded like a weak excuse to the friend who promptly borrowed a gun and convinced Jack to give it a try. Jack won the doubles title.

Now, trap shooters don't usually borrow guns for competitive shoots, and they darn sure don't win titles on their first try. But Jack King isn't your average shoot-and-hope scattergunner.

That first doubles title was won almost thirty years ago, and Jack King has been winning championships ever since. Born in Henry County, Virginia, King now lives in Greensboro where he operates his own trap and skeet range three days a week.

King doesn't shoot a $12,000 shotgun; he doesn't wear those expensive, colored shooters' glasses; and he never throws away empty shot shells either.

What he does is break clay pigeons. Consistently. He began shooting trap and skeet when he was forty years old, which is far later than most competitors begin. He is seventy now and quite possibly one of the best in the country. By his own count he has won somewhere between 300 and 500 local shoots in North Carolina and surrounding states. As a matter of record, he has won 35 North Carolina State trap championships.

"There's no reason why anyone can't become a good shot at skeet or trap, but some people's reflexes are just not good enough to break them all."

But Jack King is also a champion skeet shooter. He has won fourteen State skeet titles and is probably the only shooter in U.S. history to have won two or more titles in all trap and all skeet categories. Oh yes, he has also won and tied for several National and World championships and is the first shooting sport participant to have been inducted into the North Carolina Sports Hall of Fame.

I went to Pinehurst for the North Carolina State Trap Shoot to meet Jack and to watch him shoot. At that competition, he won the singles title — the only class he entered — with the first perfect score ever shot in a North Carolina State Trap Shoot; 200 hits in 200 shots. Obviously, a shooter of Jack King's ability can teach the rest of us something, and here are some pointers Jack offered in response to my questions.

WILDLIFE — "First of all, Jack, what's the difference between trap and skeet?"

King — "The difference is distance, mostly. In skeet the longest shot is about 23 yards, while in trap the shortest distance is 36 to 40 yards if you're shooting at the right speed. In skeet shooting, every target travels in approximately the same direction so the shooter knows where it's going every time. The shooter moves through a complete half-circle, stopping to shoot from specific shooting stations. The targets are thrown from a high house and a low house, one on either side of the shooter.

"In trap, the targets are thrown from one low house sitting down in the ground in front of the shooter. The trap house throws the birds out at different angles each time, and the shooter moves through five shooting stations to break them."

Wildlife — "For a beginner at trap or skeet, what's the most important thing to do?"

King — "The main thing is to get a gun that's made for what you want to shoot. For skeet, you need an open choke, or skeet barrel. A skeet choke is a little more open than improved cylinder, which is a good quail choke. But because the targets are shot very close, an open choke is fine.

"In trap, your gun is even more important because of the greater distance. You need a tighter pattern, like a full choke, and your gun has to fit you just about perfectly."

Wildlife — "What about the size of shot?"

King — "Well, 7½ is the biggest shot you can use at either game. In skeet, most people use 9's, but some use 8's. In trap, it's 8's and 7½'s. Some tried 8½'s for awhile, but they didn't prove practical."

Wildlife — "What makes the difference between a

Photography by Ken Taylor

good shooter and a real expert?"

King — "I think that's a whole lot like an athlete in any other sport. You'll find ball players who are good and ball players who are great. Sometimes, it just boils down to how quickly some people pick things up. There's no reason why anyone can't become a good shot at skeet or trap, but some people's reflexes are just not good enough to break them all, and that's what you have to do."

Wildlife — "How often does a shooter need to shoot to do well consistently?"

King — "That depends a great deal, I think, on starting off right. Get the fundamentals down first."

Wildlife — "What are the fundamentals?"

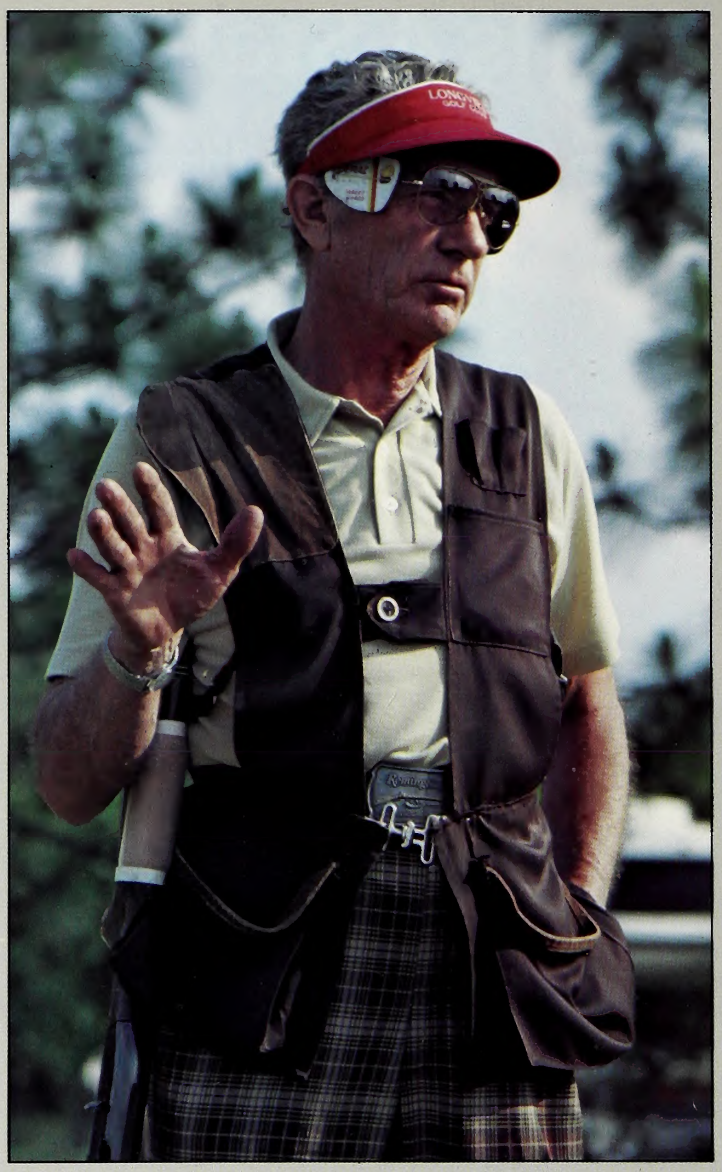
King — "Well, you would really have to go out on the range to demonstrate them. How you stand is very important, where you call for the bird, and where you try to break it. And then you have to know how much to lead it. In skeet, there are so many leads and so many different ways you have to hold your gun to pick up the bird.

"Many times you'll see a shooter point his gun at the house before he even calls for the bird, and then the bird gets so far ahead that the shooter never catches it. Anyone who wants to start shooting skeet or trap should get someone who is a good shot to start them off fundamentally right. Then the shooter can make some little adjustments to suit his own reflexes."

Wildlife — "Why didn't you start shooting when you were younger?"

King — "I couldn't afford it. I wish I could have started when I was about fifteen. I did not shoot during the first twenty-five years of my prime; you might say I was worn out before I started."

Wildlife — "Does it cost a lot to shoot trap and skeet?"



"Many times you'll see a shooter point his gun at the house before he even calls for the bird, and then the bird gets so far ahead that the shooter never catches it."

King — "Yes it does. Of course, you can cut down on the cost by reloading your own shells. You can reload shells for about half what they cost new."

Wildlife — "How often do you shoot?"

King — "I've got a little skeet and trap range in Greensboro where I shoot some every week. Usually someone will say, 'Come on Jack, shoot a round with us.' That's how I do most of my shooting."

Wildlife — "Do you teach other people to shoot?"

King — "Yes sir! One of my pupils shot 99 out of 100 here at Pinehurst, and then asked me to kick him for missing that one bird. See, he missed one he knew he should have hit. This is very much a mental thing once you learn the basics. It's awfully hard to concentrate on just what you want to do every time you call for the bird. When you say 'pull' in trap, you don't know where the bird is going to go, and you have to have your mind open so that no matter where the bird flies, you find it and break it."

Wildlife — "Do you watch how the birds are flying when the other shooters in your squad are shooting?"

King — "No, I watch the first one or two to see what kind of flight they have. Then I don't look at any birds but mine. It's too confusing for me. In trap, I don't want to anticipate where the bird may go. I want to find it wherever it goes and shoot it.

"In skeet, you know where the target is going so you try not to let it get too far in front of you. You get your lead, and shoot it."

Wildlife — "How do you establish the proper lead?"

King — "The system I use came from hunting quail since I was about 12 or 13. It's experience. When the bird comes out and I see where it's going, I try to get the amount of lead I know it will take to break it at that particular angle. When I see the bird, I know whether I need to lead it a foot or two feet or shoot six inches to one side. I shoot these clay targets just like I shoot quail."

Wildlife — "Does trap or skeet shooting help you become a better quail shot, or vice-versa?"

King — "I was a better quail hunter before I started shooting trap and skeet. When a quail gets up, you shoot at it; and if you miss it, you shoot at it again. In trap and skeet you can only shoot at a target one time. I've had quail get up in front of me, and I would take one shot, then watch them fly away."

Wildlife — "What is the most common reason why you might miss a shot?"

King — "Nearly every bird I miss, I shoot over the top of it because I hold what's called a low gun. I shoot with one eye, and that makes it harder to come back down on a bird that stops rising."

Wildlife — "You mean everybody doesn't shoot using one eye?"

King — "No, the majority of shooters keep both

eyes open, and most of them can shoot better that way. You don't lose the bird under the barrel that way."

Wildlife — "Do you shoot a custom-made gun?"

King — "Custom made by Remington by the thousands. It's a standard Remington Model 1100 trap gun. You can go down and buy one at any hardware store. It's a semiautomatic, and it's good for ducks, geese and doves, too. You wouldn't believe it, but some people shoot a $35,000 or $40,000 gun. I bought this Remington about six years ago for $200, including the case, and it'll probably outlast me."

Wildlife — "Do you use any special equipment on your gun?"

King — "I use a pad on the side of the stock to help protect my face from the kick and vibration. When you shoot 300 times with a piece of wood up against your face, it can get to you. That pad also helps the gun fit me better."

Wildlife — "How important is it to have a gun that fits you?"

King — "Oh, it's terribly important, especially in trap where you are shooting at greater distances. You should make sure that you look directly down the barrel when you bring the gun up to your cheek. If the stock is too short or too long or doesn't have the right drop, you sight the gun at a different angle every time you shoot."

Wildlife — "How do you judge whether the gun fits?"

King — "The best way, I think, is to check the distance between your thumb and your nose when the gun is in position. When you've got the gun up against your shoulder and cheek, you should have one or two finger widths between your nose and the thumb on your trigger hand. If there is more space than that, you are likely to move the gun sideways and look down the barrel at different angles each time."

"The majority of shooters keep both eyes open, and most of them can shoot better that way. You don't lose the bird under the barrel."

Wildlife — "Is there anything unusual about your gun?"

King — "Not much. I've changed and adjusted the stock pad a couple of times, and I use a release trigger."

Wildlife — "What's a release trigger?"

King — "A release trigger moves forward and fires the gun when you release it. You load the gun, pull the trigger back, and then release it when you want it to shoot."

Wildlife — "What is the advantage of that kind of trigger?"

King — "I started using a release trigger when I began flinching several years ago. Just before I would fire the gun, I would tighten up in anticipation of the kick. Of course, that hurt my shooting. The release trigger has helped me stop flinching. It's also extra wide, and that gives me a better feel of the trigger. This type trigger is quite common among trap and skeet shooters."

Wildlife — "Do you hold your gun in any special way?"

King — "There are several important things about the way you hold the shotgun. First, you should bring it up to your cheek and shoulder simultaneously. Don't bring it up to your shoulder and then put your head down. Keep your head down from the time you bring the gun up until you break the bird.

"Second, if you'll hold your left arm forward on the forestock (for right-handed shooters), it will help you move the gun more smoothly. When you move your left arm too far back, it makes your movements more jerky.

"I get the gun in position to shoot, call for the bird and see where it's going. Then I close my left eye, get the lead I need, and break the bird."

Wildlife — "How do you sight the bird?"

King — "When your head is down and you are looking right down the barrel, the front bead and the back bead should be in line. When you get the front sight on the target, shoot it."

Wildlife — "Jack, you know you've given away some secrets here, don't you?"

King — "Heck, I've been doing that for years. I've helped many people improve their shooting, then had them turn right around and beat me."

Rick Estes, who is the Piedmont field representative for the N.C. Wildlife Resources Commission's Division of Information and Education, relates that when he interviewed Jack King to get this story, Jack took him to the trap range. Estes missed his first clay pigeon, but hit the second.

"Well, that's enough," said Estes. "I know how to do it now."

"That's fine," replied King. "Sometimes it takes at least three shots to teach some people."

IT'S THE LAW

Many new laws affecting wildlife were passed by the Legislature. Here are some of the most significant ones.

By Mark Taylor

It's a fact of life that many battles for wildlife and conservation are ultimately won or lost in state and national legislative chamber. North Carolinians have traditionally shown great zeal in passing wildlife legislation, often resulting in conflicting and confusing laws confined to single counties or even smaller geographic areas. This has been going on for some time. In 1909, T. Gilvert Pearson, a Tar Heel citizen and a founding father of the National Audubon Society, termed North Carolina the "champion of local laws." Pearson, a supporter of uniform wildlife laws based on sound professional management logic, was frustrated by the fact that of the 202 wildlife laws passed in one year the United States and Canada, 69 were passed in North Carolina with only one of the 69 laws having statewide consequence.

The same situation exists today, as evidenced by the 1979 session of the North Carolina General Assembly. By the closing of the session, 50 bills were acted upon that directly affected wildlife and over a 100 bills were acted upon that indirectly affected wildlife. While a comprehensive review of these bills is impossible, the following summary of some of the more important bills should be of interest. It should be pointed out that the State's wildlife regulations are adopted by the N.C. Wildlife Resources Commission and that the actions and regulations of this agency are determined by the bills passed by the legislature.

Bills Adopted

SB 215 — To permit doe days in Pender County.

SB 340 — To prevent the use of artificial light in areas inhabited by game in Iredell County.

SB 391 — To prevent the use of artificial light in areas inhabited by game and to prohibit taking foxes or deer with dogs in Alamance County.

SB 726 — To permit any person applying for a hunting license to make a voluntary contribution of fifty cents (50¢) to a Hunter Safety Education Program.

SB 799 — To permit hunting of game birds while feeders are in operation on controlled shooting preserves.

HB 361 — To repeal Section 1 of Chapter 466 of the Session Laws of 1947 relating to deer hunting in Beaufort County.

HB 373 — To prohibit hunting with firearms from the right-of-way of highways in Caldwell and Yadkin counties.

HB 395 — To extend the raccoon hunting season in the counties of Rutherford, Cleveland and Polk.

HB 578 — To amend Chapter 269 of the 1975 Session Laws to prevent the use of artificial lights in areas inhabited by game in Stokes County. (Amendment added Alleghany and Rowan counties.)

HB 294 — To prevent the use of artificial light in areas inhabited by game in the counties of Wilkes, Caldwell and Yadkin.

HB 602 — To amend Chapter 269 of the 1975 Session Laws to prevent the use of artificial lights in areas inhabited by game in Lenoir County. (Amendment adopted in Senate added Jones County.)

HB 603 — To prohibit the taking of female deer in Martin County.

HB 632 — To regulate possession and use of firearms on highways in Moore County.

HB 640 — To permit taking female deer in Duplin County.

HB 645 — To prohibit hunting or taking bear in Camden, Chowan, Currituck, Dare, Pasquotank, Perquimans, Tyrrell, and Washington counties.

HB 652 — To prohibit any person from hunting deer with a rifle having a bore larger than .22 caliber in certain townships in Moore County.

HB 675 — To prohibit deer hunting in the area north of US 74 in Cleveland County that is not in a wildlife management area.

HB 687 — To prevent the use of artificial light in areas inhabited by game or nongame animals in Greene County.

HB 755 — To restrict the discharge of rifles in Northampton County to stands at least eight feet from the ground.

HB 761 — To repeal Chapter 414 of the Public-Local Laws of 1941, which regulated the setting of traps in Stokes County.

HB 795 — To require persons hunting deer with rifles in Camden, Chowan, Currituck, Dare, Pasquotank, Perquimans, Tyrrell and Washington counties to secure the written consent of the landowners.

HB 797 — To amend Chapter 435 of the 1977 Session Laws authorizing the Board of Commissioners of Dare County to create a Dare County Game and Wildlife Commission.

HB 1202 — To establish a fishing license to cover all persons fishing as temporary guests of a resident or property owner on inland waters.

HB 1227 — To specify that predator control, sport-hunting for nonfood game, and trapping do not constitute cruelty to animals.

HB 1435 — To direct the WRC to study the feasibility of establishing hunter education programs and of requiring persons engaged in the hunting of big game animals to display on their person a minimum amount of color known as hunter orange.

SB 564 — Raises motorboat registration fees from $3 to $5.50 per year and from $7.50 to $13 for three years. Fees for change of ownership or lost certificates were increased from $1 to $2.

HB 1406 — Supports federal boating safety and facility development assistance to qualifying states from the federal tax on boat fuel.

SB 778 — Increases the fees for hunting and fishing licenses. A resident combination hunting and fishing license will increase from $10 to $12.50 and a residents sportsman's license will increase from $25 to $31. Complete license fee license schedules are available from individual license agents.

HB 169 — Makes appropriations for current operations of state departments, institutions, and agencies, and for other purposes. This bill allows the Wildlife Resources Commission to continue to operate existing programs until solutions to budgetary problems can be found by a special legislative study committee.

SB 226 — This is the well-debated "Game Law," which renews, revises and consolidates all of North Carolina's laws relating to the conservation of wildlife resources. One provision of the law abolishes all local wildlife laws not specifically listed for retention under the new legislation. A total of 160 local wildlife laws will be retained. Another provision allows violators to be assessed "replacement costs" for fish and wildlife taken in their crimes, and replacement costs can also be levied against those who destroy wildlife habitat. Penalties for commercialization of wildlife have also been toughened, and the law sets minimum and maximum fines and sentences for all wildlife violations. Two points in this law limit the Commission's control of fox management and hunting with dogs. The law provides that, before the fox can be trapped or hunted with firearms in a county, a study must be made of the fox population in that county. Then a local law must be passed authorizing either countywide fox hunting with firearms or trapping. Foxes may be run with dogs year-round before such population studies are made. The bill also gives the Commission very limited authority to control hunting with dogs in the eastern half of the State. Many other stronger points are included in the new law, and Bob Hazel, executive director of the Commission, has termed the bill a milestone in wildlife legislation. Many other wildlife related bills were acted upon, but not adopted for various reasons. Several bills dealt with potential sources of funding for supplementing the Wildlife Commission's ailing budget. These will, no doubt, be addressed by the special legislative committee appointed to study this matter.

Bills Not Adopted

Some bills which did not pass are also listed in the following summary:

SB 563 — To require fur tagging and to increase the fees for fur dealer and trapping licenses.

SB 565 — To permit individual and corporate taxpayers to contribute all or any part of any state income tax refund for the protection and management of nongame wildlife, endangered species and threatened species.

HB 656 — Would create a special migratory waterfowl hunting license to increase funds for the Commission's migratory waterfowl program. The license would cost $3.25, with $3 going to the State's waterfowl program and 25 cents going to the license agent. This special license would be required for all waterfowl hunters in North Carolina.

HB 1205 — Would prohibit the sale of game animals and game birds by revising the provision of the law interpreted to authorize their sale in open season.

SB 744 — Provides that the interest accruing on the State Game Fund be paid to the State Game Fund.

Letters

Dear Sir:

I've seen several recent issues of your publication, and would like to subscribe to it. I am an environmental designer and currently a graduate student in landscape architecture. For a long time, I've been looking for an interesting and informative wildlife magazine that is not preachy or cutesy-pie — yours seems to fill the bill.

Barbara Koenig
Monroe, Ga.

Dear Sir:

I would like to commend you for what is the most attractive as well as the most beautiful edition, and most interesting issue of your magazine I have ever read — your July 1979 issue.

The beautiful mountain pictures — then the really outstanding work of Bob Dance on the coast, all in one issue!

Ammons Sears
Stuart, Va.

Dear Sir:

As a long time subscriber of WILDLIFE magazine, I compliment you on your July issue. As a resident of the "outer banks," Mr. Dance's art display made this the most memorable copy that I have ever been privileged to receive.

Are there reproduction copies of Mr. Dance's works available? Secondly, are there additional single issue copies of your July WILDLIFE available and if so, what would be the cost per copy?

Again, let me compliment you and your entire staff on the July issue as well as the excellent job month in and month out.

R.H. Wrenn
Kitty Hawk

Copies of WILDLIFE are available as long as our limited supplies last at 50 cents per copy; however, stocks of many recent issues have been exhausted. Unfortunately, there are no prints available of Bob Dance's paintings in the July issue. See our answer to Ron Duranske.

Dear Sir:

I have been boating since the age of seven. In 19 years, I have paid strict attention to the rules of the water and right-of-way. I am increasingly distressed by the lack of respect and knowledge on the part of other boaters on our lakes. I understand all too well that there are *too* many boats on the water; however, this only emphasizes the desperate need for a more educated public concerning the rules of the road in water traffic. All too many boaters have never bothered to pick up a book to read and study boating even enough to know port from starboard. Apparently the rational is that if the financing can be paid once a month on a boat, then certainly we are qualified to pilot it.

Now we are faced with a serious problem. More and more *extremely* powerful boats cruise the waters. Recreation is for everyone, but with the right to recreate comes the responsibility to maintain a knowledge of boating regulations and a respect for others which is derived purely through courtesy.

If safety requires that power boat operators be licensed, then I am for it, particularly if that is the only incentive boaters have to learn regulations. If stricter enforcement is necessary, then I am for that as well. Whatever the case may be, it is now more than ever essential that we, the boating public, open our eyes a little wider and check over our shoulders a little more often. Boating is fun, but being injured or killed in a boating accident is a defeat for the public and its system and also for the technology which allows us to breeze over the water as we will.

I want to thank you for not only your consideration of this letter, but also thank your officers for their hard work and weekends spent at this work. They are appreciated more I am sure than they could ever realize.

Chuck Spencer
Thomasville

Dear Sir:

I am pleased to renew my subscription to WILDLIFE IN NORTH CAROLINA. I enjoy your magazine thoroughly and look forward to it in the mail each month. Having lived in North Carolina all my life until I recently moved to Virginia, it lifts my spirits when I read news and features about my home state. I am an avid duck hunter and fisherman and I do most of it in North Carolina. I enjoy reading articles about such things.

Keep up the good work and this home-grown Carolinian will always keep reading because "I like calling North Carolina home!"

Kevin Hester
Portsmouth, Va.

Dear Sir:

I enjoyed the pictures in the July issue of WILDLIFE painted by Bob Dance and I would like to obtain reproductions of them for my office wall. As I frequently enjoy the areas where these paintings were made, they bring back a lot of fond memories. Mr. Dance does a fine job of capturing the life and beauty of these areas. Please inform me if prints are available.

Ron Duranske
Raleigh

We have had many requests for prints or reproductions of Bob Dance's paintings. Unfortunately, they are not available since all the originals are now in private collections. Some other Dance reproductions are still available, and others may follow. You may want to contact Remarque, Inc., 1412 Wiltshire Street, High Point, NC 27260 to inquire about these reproductions. Remarque handles Dance's work.

Dear Sir:

The article on Rocky Mountain Spotted Fever in the June issue of WILDLIFE IN NORTH CAROLINA interested me a great deal, since I survived an attack of the disease several years ago. However, I would like to offer a suggestion concerning the removal of ticks. I've found that fingernail polish remover, applied directly onto a seized tick, encourages the tick to let go of the flesh. This prevents infection which may occur if part of the tick breaks off during the removal process. I've used this method many times, with a great deal of success, and I hope that your readers will find it as useful as I have.

I enjoy your magazine very much, and I hope that the articles, photos and art work continue to provide such an informative and vivid picture of North Carolina's natural resources.

Susan M. Schulken
Lake Waccamaw

Extensive Reservoir Proposals

Mark Taylor

Jeff Fain, news director for a country-western radio station in Eden, has been spearheading opposition to proposed Corps of Engineers plans to dam the Dan, Mayo and Smith rivers

A group of Eden residents recently sponsored a canoe race with a new twist; the race was held to protest proposed U.S. Army Corps of Engineers plans to dam the Dan, Mayo and Smith rivers in Stokes and Rockingham counties in North Carolina and Henry County in Virginia.

The race was sponsored by WCBX in Eden, a country-western radio station. Jeff Fain, the station's news director, has been one of the key figures in the fight against the proposed reservoirs.

"We decided to sponsor the canoe race to call attention to the plight of these rivers," said Fain. "We've had about 200 contestants enter the race, and probably another 1,000 spectators. We want to get people out on the rivers so they will see what's there."

The Corps has four alternative plans for the rivers, three of them involving reservoir construction. Under Plan D, one of the Corps favored plans, reservoirs would be constructed on the Mayo River in Rockingham County, on the Dan River in Stokes County, and on the Smith River in Henry County, Virginia. The reasons given are flood control, hydroelectric power generation and recreation.

"There are very few free-flowing rivers left in North Carolina, so I can't see why we should ruin the few rivers left to build more reservoirs," said Fain. "I've lived here for ten years and only seen the Dan River go over its banks a few times. Flooding only hurts those foolish enough to build directly on the river's banks. We've also found that 77 percent of the land along these rivers is owned by commercial and industrial interests and utilities. Why should the taxpayer foot the bill for these private interests? We also don't need more flatwater recreation because plenty is already available. Any need for power could be handled by peak-period pricing to spread out the demand."

WCBX has been promoting Corps Plan E which calls for no reservoir construction. This plan would control flooding by building dikes in problem areas and removing an existing dam in Danbury, Virginia which is actually causing many of the flooding problems. Flood damage would also be reduced by strict floodplain zoning.

The Corps own figures show that of the four plans, plan E which calls for no reservoirs, is by far the most economical and has the highest benefit-cost ratio. Plan D, calling for the three reservoirs, would cost a total of $600 million. The annual benefits would be $89.6 million while the annual charges would be $57.1 million (a benefit-cost ratio of 1.6). Under Plan E, with no reservoir construction, the total costs are estimated at only $2,231,000. Annual benefits would total $4.2 million while annual charges would be $495,000 for a benefit-cost of 9.3.

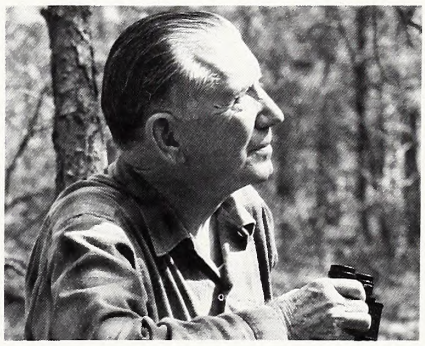
An 85 mile stretch of the upper Dan River is currently being considered for inclusion in the nation's "Wild and Scenic River" system which would preclude any reservoir construction along its length. The stretch being considered by Congress runs from the river's headwaters to a point approximately two miles above the US 311 bridge in Stokes County. The Corps will not make its final recommendation on the projects until some time in 1980.

"One question I asked the Corps at a public hearing is, 'what if we decide we have made a mistake after the reservoirs are constructed?' " said Fain. "Their answer was, 'it would be too late, the damage would be irreversible.' "

Well-Known Conservationist Retires

Dr. Frederick Barkalow, a longtime professor of zoology at NC State University and a well-known figure in North Carolina conservation and wildlife circles, recently retired from his post at the university.

Dr. Barkalow has served NC State University's Zoology Department since 1947. From 1947 through 1950, he was also the NC Wildlife Resources Commission's principal biologist. He was the head of the university's zoology department from 1950 through 1963.



Dr. Frederick Barkalow, a longtime professor of zoology at N.C. State University and a regional director of the National Wildlife Federation, recently retired.

Dr. Barkalow's honors are many. He earned the American Motors Conservation Award in 1957, won the Governor's Award for Conservation in 1968, and has been a delegate to many national and international conferences and committees on environmental matters.

He is also extremely active in the National Wildlife Federation. Currently, Barkalow is regional director of the Federation, and has served as president, secretary, and vice-president of the North Carolina group. He is also an active writer, and has written two books on wildlife as well as many articles for technical and popular publications. His hobbies include hunting, big game fishing and fly fishing and archaeology.

Wild Turkey Harvest For 1979 Reaches All-Time High Point

The 1979 wild turkey harvest reached a record high in North Carolina this past spring as over 200 wild turkeys were reported taken. This is the first time the reported harvest has gone over 200 birds since the initiation of a spring gobbler's only turkey hunting season and the establishment of a mandatory reporting system. The statewide kill — including a few known, but unreported kills — was 210 birds. This represents an increase of about 35 percent over last year.

An analysis of the harvest on a regional basis shows that the Coastal Plain kill decreased by four birds from 1978. This was largely the result of a decrease of five birds on Camp Lejeune and two birds in Martin County. In the Piedmont, the kill rose by about 75 percent and the kill in the Mountains rose by a whopping 300 percent.

"The statewide increase is believed to be due to several factors," said Wayne Bailey, a biologist with the Commission's Division of Game. "One reason is that turkeys have produced good broods of young for the last two years. We've also had a particularly good increase in turkeys and in hunting opportunities in the Mountains where the Commission has stocked 17 areas with birds since 1970. Turkey hunting is also growing more popular and we're seeing an increase in the numbers and in the skill of turkey hunters. Finally, more hunters are reporting their kills."

Turkey populations appear to be rising in the Mountains, but the birds have a long way to go before all the available habitat is filled. Mountain turkey harvests are expected to rise significantly during the 1980's.

While turkey harvests will probably fluctuate in the Piedmont and Coastal Plain in the coming years, Bailey doesn't expect the population and harvest to improve. Most of the suitable habitat in these areas is already occupied by the turkeys. Also, habitat is being destroyed or is deteriorating in the face of advancing development. The population trend is towards a decline in the Piedmont, and Bailey believes we will do well to hold on to what habitat is left and prevent its further degradation.

The 1979 harvest, on a county basis with "known, but unreported" kills in parentheses, is as follows: Alamance, 9; Ashe, (1); Bertie, 11; Burke, 1; Caswell, 73; Chatham, 9; Cherokee, 8; (3); Clay (2); Edgecombe, 1; Graham, 1; Granville, 1; Halifax, 1; Henderson, 2; Jackson, (1); Johnston, 3; Macon, 11 (1 unreported, 3 pre-seasonal); Madison, 5; Martin, 5; McDowell, 2; Montgomery, 6; Moore, 3; Onslow, 22; Orange, 3; Person, 16; Polk, 2; Randolph, 2; Richmond, 2; Rockingham, 3; Swain (1 plus); Transylvania, 1; and Wake, 3 (1).

Total spring harvests for the years 1974-79 in chronological order, are as follows: 98, 104, 153, 160, 139 and 210.

Kitty Hawk Bass Prosper

Kitty Hawk is best known as the birthplace of aviation, but the area has other unique features. Biologists from the N.C. Wildlife Resources Commission's Division of Inland Fisheries are studying the largemouth bass in Kitty Hawk Bay. These bass appear to be faring extraordinarily well in the brackish waters.

Pete Kornegay, a Commission fishery biologist from Elizabeth City, is running a research program to find out why the fish are prospering.

"It's not unusual to find areas that have large bass populations," said Kornegay," but it is unusual to have such a large proportion of the fish reach moderate size."

Kornegay feels that the key lies in the proximity of two different environments.

"Kitty Hawk Bay is near highly productive saltwater estuaries, giving bass and bream a unique diet," he said. "We think that a large portion of young fish in Kitty Hawk Bay are reaching harvestable size because of the variety of food types and abundance of this food in nearby estuaries."

D-J Program May Be Expanded

A proposal is afoot to expand the Dingell-Johnson Act which provides for an excise tax on fishing equipment.

Under the expansion, a three percent excise tax would be charged on all new boats, motors and trailers. Fishing tackle covered by the D-J Act is currently taxed at ten percent.

The funds produced by the D-J program are distributed among the states depending upon each state's land and water area and the number of fishing licenses sold. According to a recent Coast Guard survey, 72 percent of the nation's boating households use their vessels most frequently for fishing. Commercial fishing boats over 25 feet long, kayaks, sailboats and hydroplanes would be exempt from the proposed tax since these boats are rarely used for recreational fishing.

D-J funds can be used for a variety of purposes, including fisheries research, developing new fisheries and construction of fishing lakes and fishing access areas. Officials estimate that the proposed expanded excise tax would add approximately $100 million annually to the program. Since the D-J program was initiated in 1950, $252 million has been returned to states for D-J projects. The expanded D-J program would also tax fishing lines, tackle boxes and other related angling items that are currently exempt from the program at the 10 percent level.

The North Carolina Wildlife Resources Commission currently receives about $400,000 in D-J funds annually. If the program is broadened, the Commission would receive about $1,200,000 in D-J funds annually. A portion of these funds could then be shared with the Commission's Division of Boating for boating access and with Marine Fisheries for use in its saltwater sport fishing management programs.

Steelheads Thriving

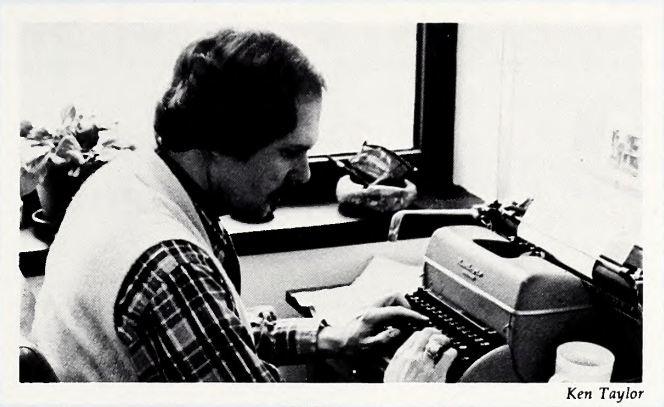
There's some good news for mountain anglers. The steelhead trout stocked by the Commission in our large, mountain lakes have taken hold and are thriving and reproducing.

Steelhead trout are native to the Pacific northwest and are essentially rainbow trout that have retained their migratory instincts. In their native range, the fish migrate to the sea. Some years ago, they were introduced into the Great Lakes with spectacular results, and are now being stocked in some suitable cold, fresh-water power reservoirs throughout the South and West. When the fish are stocked in inland waters, they migrate upstream from the lake into a stream or river.

In North Carolina, the fish have been stocked in Nantahala, Santeetlah, Fontana and James lakes for the past four years. Our steelhead successfully spawned in January and February this past winter, and spawning runs should now be an annual occurrence. Lake Chatuge received its first steelhead stocking last spring.

North Carolina's steelhead are raised in Commission hatcheries from eggs shipped from Washington, Oregon and Michigan. The eggs are raised to six-inch fry and are stocked in streams which feed suitable lakes. The fish spend their whole lives in the lake, except for their short, annual spawning runs.

Between 50,000 and 60,000 steelhead trout have been stocked each year since the program started and over 100,000 steelhead were stocked this year. Landlocked steelhead are usually distinguishable from rainbow trout by their bright silver color. Steelhead also grow larger than rainbows, and a 30-inch landlocked steelhead is not uncommon. During the spring and fall, fishing is best near river and creek mouths. Trolling bucktail flies and small spoons near the surface should work, and worms have also proven effective just prior to the spawning run. In the summer, the fish will be down deep, and your best bet may be to troll deep with a shad-like lure or use a live minnow fished deep.



Ken Taylor

"Our goal is to publish one of the very best nonprofit state wildlife-oriented magazines in the country."

Jim Dean Named Editor Of Wildlife In North Carolina

Jim Dean of Raleigh has been named editor of WILDLIFE IN NORTH CAROLINA magazine, replacing Duane Raver of Cary who retired June 30, 1979. Dean has been associate editor and promotion director for the magazine since the magazine's format was changed in January, 1978.

WILDLIFE IN NORTH CAROLINE is published by the Division of Information and Education for the State Wildlife Resources Commission.

"We've made a lot of changes in the magazine in the past 18 months; and from the increased number of letters we've received, it appears that our readers like what we're doing," said Dean. "Also, our circulation has increased from 48,000 to about 70,000 subscribers during this period.

"We're using more color photography and better articles, and we hope to continue to improve the contents of the magazine. We'll be covering a broad range of outdoor and nature subjects, including subjects of historical interest," said Dean. "We'll have some indepth environmental stories; and of course, we plan to give lots of space to such outdoor sports as fishing, camping, hunting and boating. To be perfectly honest, our goal is to publish one of the very best nonprofit state wildlife oriented magazines in the country."

Dean joined the Wildlife Commission in 1969 after covering sports and the outdoors for the Burlington Times-News for four and a half years. Until he became associate editor of the magazine, he was a staff writer and photographer for WILDLIFE IN NORTH CAROLINA, and developed the Commission's news release and newsletter services. For eight years, he wrote a weekly newspaper column called "Wildlife Afield" which was used by approximately 60 papers.

Dean, who has two children, Scott, 13, and Susan, 10, is the son of Mr. and Mrs. W.G. Dean of Roanoke Rapids. He graduated from Roanoke Rapids High School in 1958, and from the Virginia Military Institute in 1962 with a B.A. in English. After serving two and a half years in the Adjutant General Corps, he attended the University of North Carolina school of journalism.

May Enforcement Report

For the month of May, 1979, the N.C. Wildlife Resources Commission checked a total of 40,663 hunters and fishermen and 11,589 boaters.

Of the hunters and fishermen, 1,914 were prosecuted and 1,771 convictions were obtained. The total fines collected were $12,009 and the total costs collected were $40,750.

Of the boaters, 529 prosecutions were made and 470 convictions were obtained. Total fines collected were $758 and total costs collected were $11,299.

Other prosecutions totaled 62 and convictions totaled 55. Total fines collected were $1,040 and total costs collected were $1,242.

All fines and any arrests or witness fees are paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected is paid to the N.C. Wildlife Resources Commission.

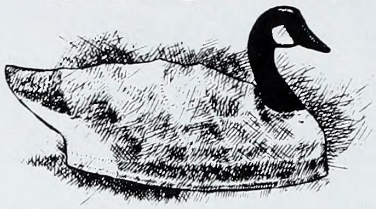
First Big Waterfowl Festival Slated At Manteo

Several nationally known waterfowl experts and writers will conduct workshops at the First Annual North Carolina Waterfowl Weekend this fall. The event which will be held on October 19-21 at the Roanoke Island Marine Resources Center at Manteo will consist of a workshop which is being sponsored by North Carolina Ducks Unlimited, the State's Office of Marine Affairs and the North Carolina Wildlife Resources Commission and a festival sponsored by the Outer Banks Chamber of Commerce and other local interests.

According to Jim Clark, who has been appointed as the weekend's official host and chairperson, "We are planning to fill several days with educational and informational activities designed to really hone the appetite of anyone interested in waterfowl, waterfowl hunting and waterfowl-related art. In addition, there will be a whole lot of fun. The Outer Banks of North Carolina is a great place to visit, especially in October.

Mr. Clark, a resident of Elizabeth City, is a very active member of Ducks Unlimited and is an ardent waterfowl conservationist and collector of sporting memorabilia.

First Annual North Carolina



Waterfowl Weekend

Manteo, North Carolina
October 19-21, 1979

The workshop will consist of a panel discussion and a series of ten "round robin" workshop sessions and will be highlighted by a banquet on Saturday evening. This will provide participants with a firsthand opportunity to hear representatives of the U.S. Fish and Wildlife Service, Ducks Unlimited, the Wildlife Resources Commission and the State's sporting public address current issues and problems pertaining to waterfowl management. Session topics will include waterfowl art, cookery, biology, hunting techniques, field taxidermy and calling as well as waterfowl retrieves and their use, photography, boats and equipment and sporting safety. Among the list of nationally known experts scheduled to present the program will be David Duffy, Dog Editor for OUTDOOR LIFE magazine, National Champion duck caller Mike McLemore, and Gene Hester, an associate director of the Fish and Wildlife Service and an expert waterfowl photographer and writer, and Billy Joe Cross, who has cooked quail for President Carter. The festival will in clude exhibits and booths by many well-known painters, carvers and sporting collectors.

Clark stated that, "Registration for the workshop will be only $20.00 per person and will be limited to the first 300 individuals who apply. Those interested should reserve their places immediately. The festival, however, will probably be visited by a great many more people."

Further information and reservation forms can be obtained from the Marine Resources Center, P.O. Box 967, Manteo, NC 27954.

Mankind-Treading The Rocky Road to Extinction?

Want some chilling reading? Take a look at a publication called *"People: An Endangered Species?"* published by the National Wildlife Federation.

The publication deals with the explosive growth of the human population in recent years. Did you know that the world population will reach 5 billion people by 1987? This is up from 4 billion in 1975 and 3 billion in 1960. The world's population is now growing by 72 million people annually — more than the entire population of Mexico.

Currently, the United Nations figures that about 500 million people in the world are severely malnourished, and the demand for food world wide is expected to double by the year 2,000. At the same time, we're losing millions of acres of farmland each year to urbanization, erosion, desert encroachment, deforestation, overgazing and other assorted environmental threats.

Unemployment will also be a big problem in the future. The labor force in rapidly developing third world countries is expected to grow by 91 percent by the year 2,000, while the labor force will grow by 33 percent in developed countries.

For a free copy of *"People: An Endangered Species?"* write to the National Wildlife Federation, Dept. WP, 1412 16th St., N.W., Washington, D.C. 20036.

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Nature's Ways

Six-Legged Sawmills

written and illustrated by Duane Raver

Few creatures strike more terror into the heart of a homeowner than termites. Much of this fear is justified since termites do thousands of dollars worth of damage to wooden structures throughout the State annually. Yet, for all their destruction, these tiny insects are interesting.

The subterranean termite (as opposed to several other varieties found over the world) is described as a social, colonial insect. Many insect groups — ants, honeybees, and so on — have strict social hierarchies which include exact division of labor and specific jobs and duties for each group. Three or four distinct physical forms develop, depending on the job or responsibility each has.

For example, the reproductive "caste" consists of mature, winged insects with dark bodies and four long wings. These emerge in early spring, and are often wrongly confused with flying ants. Ants have distinctly segmented bodies which are truly ant-like, while the bodies of the adult termites are more "tubular" or straight. Once a year, these swarming adult termites fly away to establish new colonies. Those that cannot find their way back into the ground eventually die or are eaten by songbirds. The females that make it back into subterranean nesting areas develop into egg-laying queens. If the main queen should die, secondary reproductive females are enlisted, but these generally have shorter life spans and less egg producing capacities.

The tiny white nymphs that hatch are cared for by workers of the colony. It is the slow-moving workers that we generally see when an old log or stump is turned over or broken into. Some of the workers develop into soldiers with large heads and effective pincher mouthparts. Soldiers act as guards for the colony.

Neither the queens nor soldiers damage wood to any extent, except the small amount they eat. Instead, it's the workers that both eat and excavate it, creating extensive channels that run parallel with the wood grain. These destructive activities often completely honeycomb the wood, yet the wood may appear perfectly sound from the outside until it simply crumbles underfoot or gives way structurally. Unfortunately, termites have a way of keeping their work to themselves until it's too late.

Prevention of damage through proper treatment and sound construction practices is certainly the key rather than repair of the damage. Any bits of buried wood in the crawl space under a house or around the foundation may assist termites in constructing the "shelter tubes" or tunnels which they use to climb masonry foundations and reach the flooring or frame of the house.

A homeowner should make his own visual check at least once a year, and if there is any doubt, he should obtain the services of a reputable professional exterminator.

Autumn Showcase

The red maple is the South's most common maple; and in the fall, its leaves are the most brilliant in the forest.

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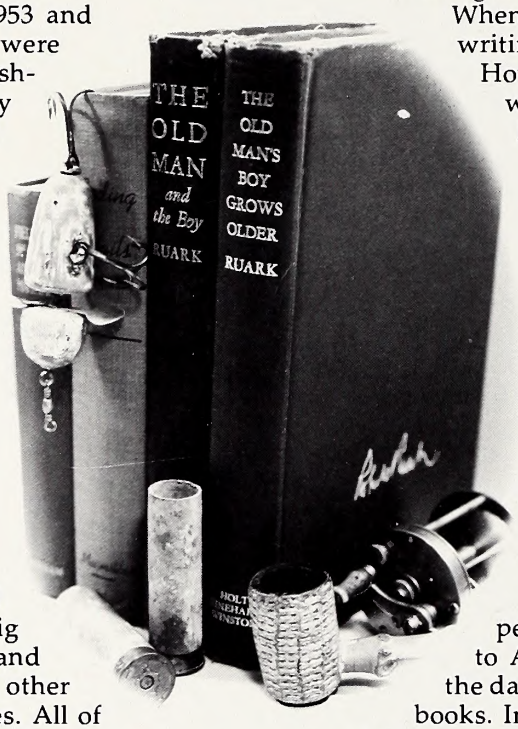
Our Natural Heritage

By Jim Dean

Robert Ruark's Legacy, "The Old Man And The Boy"

Field & Stream magazine had a definite edge on its competition two decades ago, and one of the reasons was a North Carolina writer from Wilmington named Robert C. Ruark. Chapters from Ruark's *The Old Man And The Boy*, and its sequel, *The Old Man's Boy Grows Older*, were serialized in *Field & Stream*.

Those two books, published in 1953 and 1957 by Holt, Rinehart and Winston, were largely a collection of hunting and fishing nostalgia. They were not really typical of Ruark's other work, and there was a tendency on the part of critics — and perhaps Ruark himself — to overlook them. That's not hard to understand if you consider that when he died at the age of 49, Ruark was one of the most prolific and best known writers in the country.



He was, or had been, a nationally syndicated newspaper columnist with an enormous following, a prolific novelist and a successful screen writer. In 1955, he wrote *Something Of Value*, a best seller based on the Mau Mau uprising in Kenya. More best sellers would follow including books on African big game hunting — *Horn Of The Hunter* and *Use Enough Gun* — as well as several other books and countless magazine articles. All of Ruark's books are now out of print, although many can still be found in libraries.

It seems ironic that Ruark's *Old Man And The Boy*, and its sequel seem to have endured while much of his other work has been forgotten. Hunters, fishermen and outdoorsmen still fondly remember Ruark's gentle tales of hunting, fishing and growing up in a small coastal town. Ruark tells of the initiation of a boy into early manhood at the hands of a crusty, yet philosophical grandfather. The tales are often humorous, yet they instill a high regard for personal honor, tradition and outdoor ethics.

It didn't hurt, of course, that Ruark was writing about home folks and a way of life most of us in this State fully understood. The setting was Southport (the Old Man's home), the lonely shores and marshes around Caswell Beach and Smith (Baldhead) Island, Frying Pan Shoals, and countless creeks, sloughs, swamps, forests and quail infested fields in the Cape Fear Delta.

Ruark did not live in Southport, the setting of most of *Old Man And The Boy* stories. His home was Wilmington, but he spent many weekends and portions of summers in Southport.

Born in 1915, Ruark graduated from high school in Wilmington in 1931, then entered the University of North Carolina where he took a journalism course merely to "keep an eye on a girl he liked." He graduated in 1935 and went to work for $12 a week on a small weekly newspaper in Hamlet. After two and a half months, he left Hamlet to go to sea with the Merchant Marines. By 1936, he was back in journalism as a copyboy for the *Washington Star*, and soon as sportswriter for the *Washington Daily News*.

When Ruark was 30 years old, he began writing a syndicated column for Scripps-Howard on a wide variety of subjects which *Time* magazine called "belt-level reading material." He was colorful and well-read; and by the time he had begun writing novels, he was both well-known and wealthy.

Ruark obviously enjoyed his notoriety, and he often flaunted his success as though he could not believe that life could be so perfect. Yet, there were hints that he was far from satisfied. *Poor No More*, is the story of a poor North Carolina boy who becomes a tycoon, only to realize that his life is empty of any true wealth.

By the mid-1950s, Ruark had settled permanently in Spain, and his safaris to Africa had kindled a love affair with the dark continent which influenced several books. In addition to *Something Of Value* and *Uhuru* — both violent books on the political upheavals in Africa — he wrote extensively about his big game hunting safaris. Two books, *Horn Of The Hunter* and *Use Enough Gun* are reminiscent of Ernest Hemingway's African big game hunting books.

Ruark was often called the "poor man's Hemingway," and this comparison no doubt bothered him more than he cared to admit. Most likely, Ruark wanted desperately to achieve the literary success enjoyed by Hemingway, yet he never did. Indeed, Ruark's last major book, *The Honey Badger*, may have been his worst, and he probably knew it.

At the time of his death, Ruark's career had peaked. There is evidence that Ruark was depressed, and some have suggested that the myth outgrew the man. Others believe that drinking contributed to his early death.

One would like to think Ruark knew at the time of his death that, *The Old Man And The Boy* had become a classic in the field of outdoor journalism. He once remarked that it was "the best writing I'll ever do," but whether he was proud of this achievement or simply dismayed that he couldn't do better is really subject to conjecture.

When Ruark died, a friend of mine said that he envied anyone reading *The Old Man And The Boy* for the first time. A remark like that ought to be "something of value" to any author.

October, 1979

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WILDLIFE IN NORTH CAROLINA

"Wildlife in North Carolina" is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

Robert Ruark (right) in Africa with Harry Selby.

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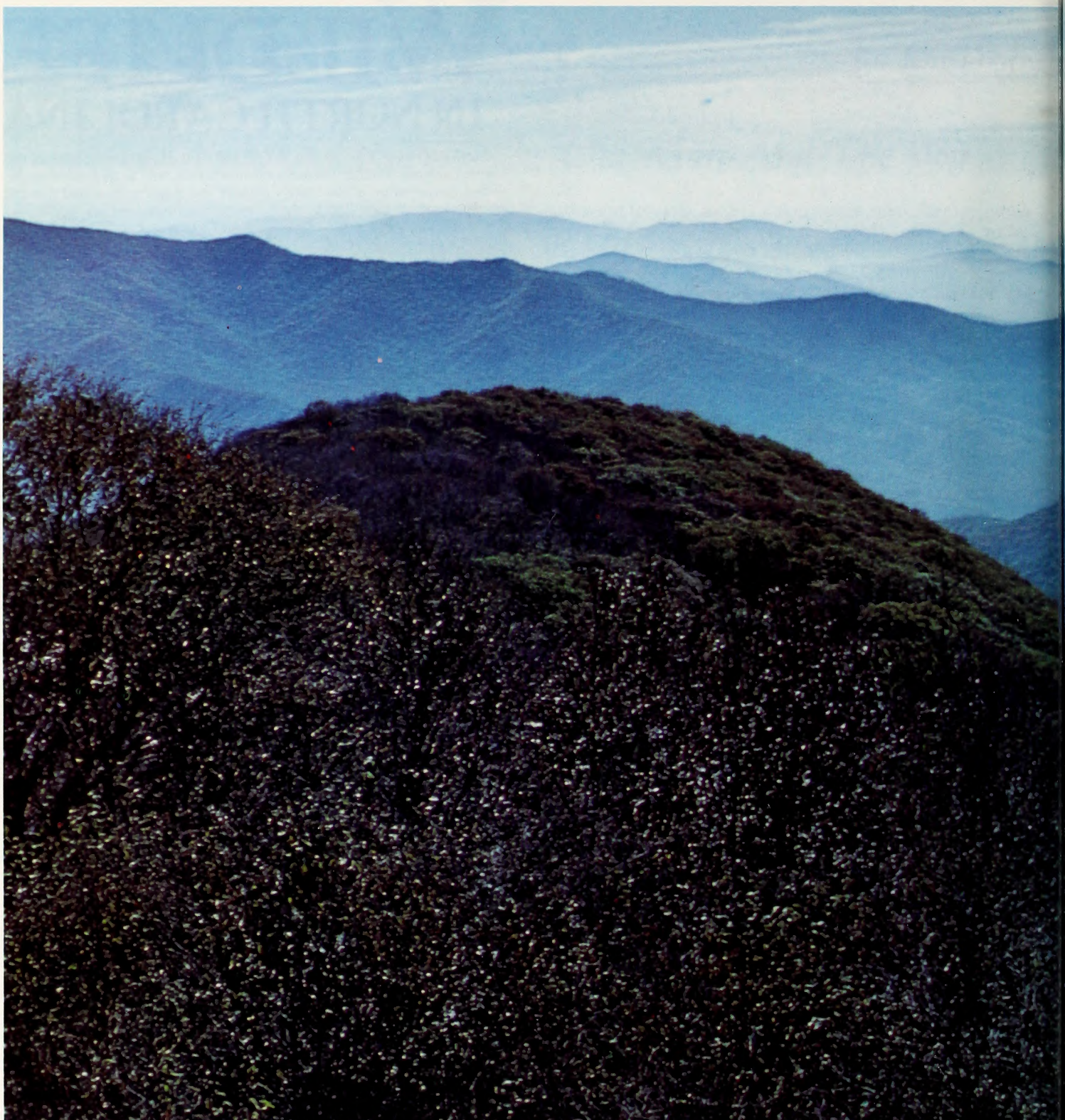
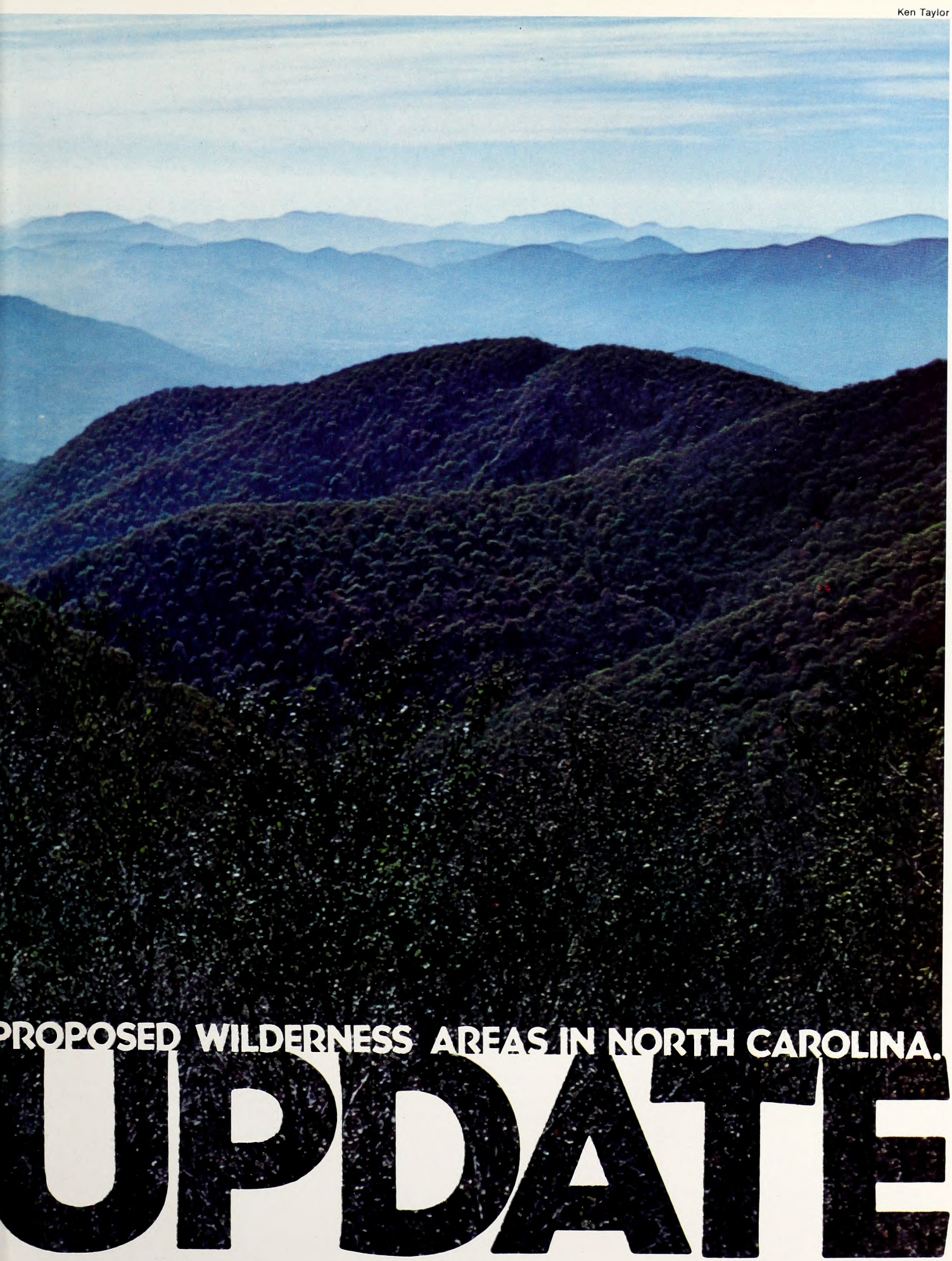


CONSIDERABLE MISUNDERSTANDING STILL SURROUND

RARE II

Ken Taylor



PROPOSED WILDERNESS AREAS IN NORTH CAROLINA.

UPDATE

BY MARK TAYLOR

North Carolinians may have some new wilderness areas now that the U.S. Forest Service has made its final recommendations under the Roadless Area Review Evaluation (RARE) II program.

RARE II was designed to assess all roadless areas on federal lands, and to decide what areas should be put into the National Wilderness Preservation System. The Forest Service found that North Carolina has 207,000 acres in roadless areas on National Forests. After extensive study, the Forest Service recommended that 15 North Carolina sites totaling 66,478 acres be declared wilderness. Approximately 116,000 acres were recommended for multiple-use management and 23,000 acres have been tabled for further planning. Wilderness values, wildlife, current use and impact on the local economy were all considered when making RARE II recommendations. Sites in the further planning category are still under study, and recommendations will be made within five years, according to officials.

On the national level, the Forest Service found that there were 62 million acres in roadless areas on National Forests. This is a sizable chunk of territory — about the size of Colorado. Of this, the Forest Service has recommended that 15 million acres be put into wilderness (24 percent), 36 million acres go into multiple use (59 percent), while 11 million acres will require further planning (17 percent). The total size of the National Forest system is about 187 million acres, so the amount of land available for multiple use is considerable. Land in multiple use is open to logging, grazing, mining, hunting, fishing and other kinds of recreation. It's now up to Congress to act on the Forest Service's recommendations. Only Congress can designate a wilderness area or take land out of wilderness classification, a point the Forest Service emphasizes.

The RARE II plan has created a great deal of controversy, much of it based on misunderstanding. Critics have charged that wilderness lands are locked up — useless to sportsmen — and will bring the country to its knees with resulting timber and mineral shortages. Preservationists, in turn, have charged that leaving lands open to multiple-use management is tantamount to rape. Neither charge is truly accurate.

For the record, there are all kinds of things you can do in a wilderness area. You can hunt, fish, hike, camp, canoe, picnic, bird-watch and graze livestock. In short, you can do just about anything you want if you can do it on foot, without the aid of motorized equipment, and leave the area as you found it. There are also some things you cannot do in a wilderness area. Motorized vehicles and equipment are out. Logging and permanent structures and roads are out.

So, is the land locked up? Not really. Has it been made economically unproductive? It depends on how you look at it. Wilderness sports, such as backpacking, canoeing and hiking, don't account for a large portion of recreational use on national forests. Yet, these backcountry sports are rapidly growing every year and participants spend tourist dollars too. There is a loss of revenue from logging and mining, but there are gains elsewhere.

What about wildlife? Is wilderness designation beneficial for wildlife? Here again, there is no simple answer. For species like deer, which thrive in areas disturbed by man, wilderness designation will mean a drop in numbers. The only openings in a wilderness forest will be then caused by fire or disease. On the other hand, animals that require solitude and large chunks of mature forest habitat will thrive under RARE II. Wild turkeys, black bear, cougars and the like will all do well. Much of the opposition by sportsmen to RARE II has arisen over the lack of vehicular access to these areas. Still, forest and wildlife managers consider this a blessing, and these areas will then afford the opportunity to take a real wilderness hunt or fishing trip without going somewhere like the Arctic Circle.

Fire and disease have been controversial points in all wilderness legislation. Forest fires that start in wilderness areas are allowed to burn, and in several cases, large fires have escaped into non-wilderness areas. A provision has been written into RARE II allow-

At least some of the controversy over proposed wilderness areas in North Carolina and throughout the nation has been fanned by misunderstanding. One persistent rumor is that no fishing or hunting would be allowed in wilderness areas proposed under RARE II. Actually, both fishing and hunting would be permitted, although access by motorized vehicle would be denied. This fly fisherman is fishing one of the streams which is under consideration for wilderness status, and his favorite sport would still be available.

Jim Dean

S. Bruce Craven

ing land managers to put out fires and stop disease epidemics which threaten to spread outside wilderness area boundaries. Both fire and disease create openings which benefit wildlife, and are an integral part of plant and forest succession. A "bad" fire versus a "good" fire — like "dirt" versus "soil" is mostly a matter of location.

One significant loophole does exist under RARE II, as well as in previous wilderness legislation. When the original Wilderness Act of 1964 was passed, an exemption was included allowing mining on wilderness areas provided that "no invasion of the surface" existed. This interpretation was broadened to allow the drilling of test holes and surface mining if "no significant damage" to the area would occur. Under RARE II, mineral exploration is allowed and new claims, permits and leases can be filed until December 31, 1983. No mineral exploration will be allowed after the cutoff date; however, claims and leases approved before then will be honored indefinitely.

"In most cases, we can require that mining in wilderness areas meet stringent standards to protect an area's wilderness values," explained Walt Rule, public information officer for the U.S. Forest Service in North Carolina. "For instance, we could require that all machinery, ore and personnel be flown in and out. We could also stipulate that only deep mining be allowed and the mine must enter from an adjacent non-wilderness area."

"One problem with eastern national forests is that much of the land was purchased from the tax rolls or from individual landowners," Rule added. "While the federal government bought the surface rights, individuals sometimes retained the mineral rights. In some cases they also retained rights to develop access and mining facilities. We can dictate how mining is done on new leases, but our control over areas where mineral rights are privately owned is solely dependent upon the restrictions and rights which were written into the original deed, regardless of the area's current status."

Mining interests have 21 active uranium prospecting permits on 18,765 acres in further planning and multiple use in western North Carolina. Uranium prospecting permits have been granted on the further planning areas of Harper Creek and Lost Cove Creek and on the non-wilderness areas on upper Wilson Creek and Chunky Gal.

An application has also been made for a lease to mine olivine on Chunky Gal in the Nantahala National Forest.

The RARE II recommendations are currently before Congress, but the outcome of what environmentalists have termed "The Conservation Battle of The Decade" still has not been decided. The fireworks will be fast and furious as representatives try to balance our need for wilderness against our demands for energy, timber and other resources. In the future, controversy over the use of our public lands will continue to be a hot issue as we try to meet the needs of a growing population with limited natural resources.

Recommended RARE II Wilderness Areas

Area	*National Forest*	*Acreage Inventoried*	*Acreage Recommended*
Southern Nantahala	Nantahala	23,046	11,634
Ellicott Rock Extension	Nantahala	3,000	3,000
Joyce Kilmer/Slickrock Extension	Nantahala	4,559	3,380
Shining Rock Extension	Pisgah	10,000	5,124
Linville Gorge Extension	Pisgah	5,939	3,801
Middle Prong	Pisgah	10,200	7,935
Burkhead Mountain	Uwharrie	5,759	5,759
Pocosin	Croatan	13,000	11,000
Catfish Lake South	Croatan	7,605	7,605
Sheep Ridge	Croatan	5,380	5,380
Pond Pine	Croatan	1,860	1,860

RARE II Further Planning Areas

Area	*National Forest*	*Acreage*
Overflow Creek	Nantahala	3,200
Snowbird	Nantahala	5,490
Lost Cove	Pisgah	5,708
Harper Creek	Pisgah	7,163
Craggy Mountain WSA	Pisgah	1,100
Craggy Mountain Ext.	Pisgah	1,280

Roads like this one which wind through most of the proposed wilderness areas in North Carolina may no longer be open to motorized vehicle traffic if wilderness status is approved. Even so, hunters, fishermen, hikers and others would still be able to enter wilderness areas on foot to fish and hunt. Since vehicle traffic would be banned, damage to roads and trails would be minimal. In many wild areas, particularly in the western part of the state, vehicular traffic has caused erosion and significant silt problems in some trout streams.

The Bettman Archive

The Famous Bobby

Wilmington's Robert Ruark was one of the nation's best known writers at the time of his death in 1965. At the peak of his career, he returned to his hometown for a brief and memorable visit, yet despite his popularity as a columnist, best selling novelist and screen writer, he is perhaps most fondly remembered for his gentle tales of a boy and an old man hunting and fishing together around the coastal village of Southport.

By Peggy Payne

Daddy had gone into the kitchen to get Bobby yet another scotch. That was when "Bobby" told Mom and me about the million dollars he had in a bank in Switzerland.

"There was no doubt about it," he wrote later in a 1963 *True* magazine. "I felt myself to be one hell of a fellow."

"I owned," wrote novelist Robert Ruark, "a paid-for, beautiful villa in Spain's Costa Brava, a townhouse in Barcelona, an English secretary, the best cook in Europe, a long-term magazine contract, a fine paperback deal, a hand-shot tiger on the wall, two of the heaviest elephant tusks ever extracted forcibly from an old bull, a couple of admiring dogs, and money in four banks. I had a closet full of fancy Italian clothes, and literally, a mink-trimmed jockstrap."

". . . And I had this Rolls Royce . . ."

It was sitting that summer morning in front of our house on Mimosa Place in Wilmington. I was a kid — maybe eight, maybe ten — brought in to meet the writer. I remember a dark man with a mustache, a drink and a Hawaiian shirt. He was my father's old high school classmate, and the day he dropped by to visit was one that added an anecdote to my childhood's family history.

His own story of his return to Wilmington, told in *True* is titled "The Man I Know Best." He laughed at himself then, called himself a "timid swashbuckler," poked fun at his pretensions and confessed to his fears. But we heard little about timidity the day he swept back into his hometown.

The Robert Ruark that Wilmington knew best is remembered as a high school cartoonist, a bright boy, who fished and hunted in Southport as a young fellow and left for showier trophies. In his later life, he brought down some larger game and a good-sized fortune, wrote some good fiction and some that was offensive.

He's thought of as a fellow who showed off a lot, who drank without ever seeming to show it. There are those who remember a brief contact and enjoy re-telling the story. There are those who recall him with anger and disappointment, and a few who would still call him a friend.

Mrs. Elizabeth Robinson was grown up when Robert Ruark was born. They were close friends in his boyhood, she said, and they remained close until he died. He would call her from New York whenever he got back to this country, she said. When he came back south, he'd visit her in the house in Southport where she was born and where she lives still.

To her she remembers "he was a brilliant boy" and "a versatile somebody."

"To me, he never changed. He would ride up here in a Rolls Royce and he was just as much at ease as if it were a Ford." But she still thought that his novel *Poor No More*, much of it drawn from the people and years in Wilmington and Southport, was "too crude."

And she told him. "He laughed," she said, sitting in her dim living room in front of the television. "He said that was the way he felt when he wrote it."

Robert Ruark, Jr. was born the week between Christmas and New Year's in Wilmington in 1915. His father is described variously as a bookkeeper and court reporter; his mother as teacher and proprietor of a small nursing home. Much of his writing and his hunting are associated with the riverbank town of Southport where he visited his grandparents.

There's a red plaque now on a house in Wilmington where Ruark lived for a few years as a young boy. And the big magnolia he wrote about still stands between the big white house in Southport where his grandparents lived and the one next door where his cousin Miss Marion St. George has always lived.

From Miss St. George's front bedroom you can see the magnolia and the porch of the house that Ruark wrote about in *The Old Man And The Boy*. She wouldn't care if they went on and cut that tree down, Miss St. George said. "It makes so much mess. But Lord help me, they wouldn't cut that down for what the war cost." People still come by regularly, to get a glimpse of that house that is the private home of another family now.

Southport is a town that is a few oak-shaded blocks wide. Freighters pass on the river not much more than casting distance from the big white houses. It's a town that has changed very slowly and very little. It was here that Ruark came to do his visiting and his earliest hunting.

He came here to see grandparents Lottie and Hawley Adkins, parents of his mother, Charlotte Ruark. His writing is thought to have combined the personalities of two grandfathers.

There were other relatives in surrounding blocks. Ruark's grandmother and Miss St. George's mother were

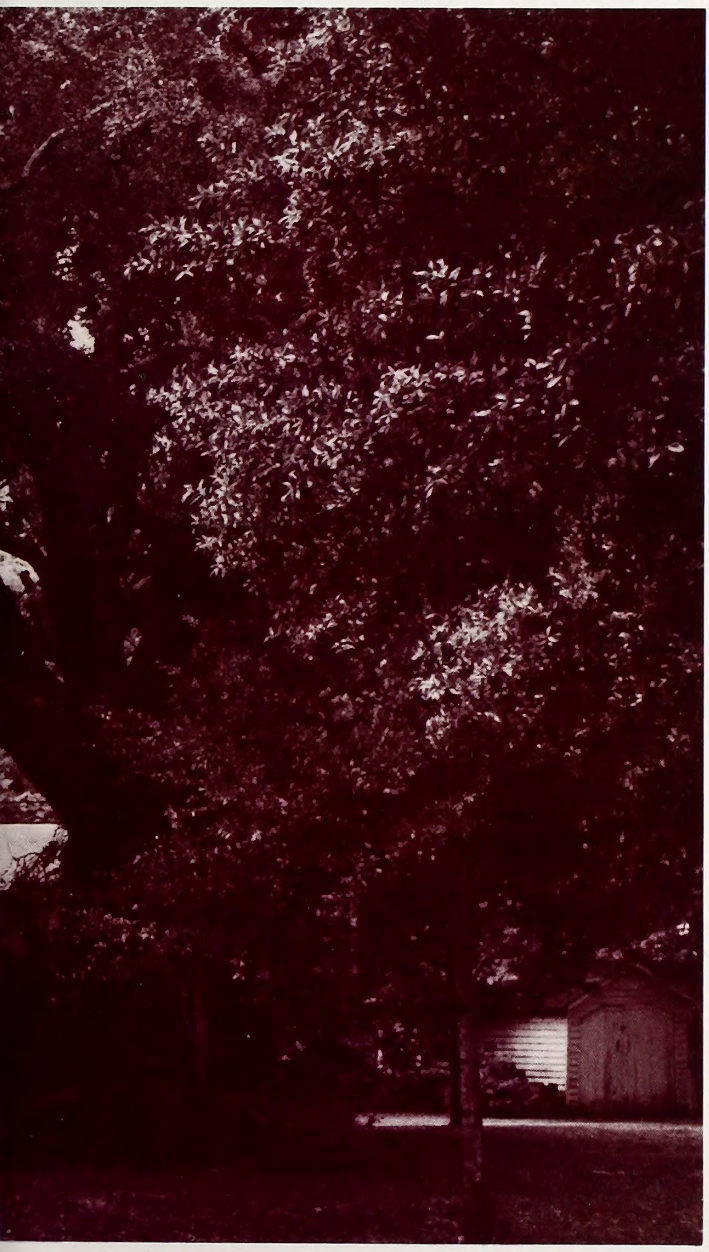
"The thing I like best about the Old Man is that he's willing to talk about what he knows, and he never talks down to a kid, which is me, who wants to know things."

"Fellow can learn a lot about living from watching dogs," he said. "Like about snakes and terrapins. The best bird dog in the world will point a terrapin, and he will point a snake. But he won't back off from a terrapin. He will point a snake and walk backward away from it. This is what the dog would call a public service."

Peggy Payne

Peggy Payne

Robert Ruark's real home was in Wilmington (left), but the house that figured so prominently in *The Old Man And The Boy* and *The Old Man's Boy Grows Older* is the home of his grandparents, Lottie and Hawley Adkins, on Lord Street in Southport (below). Now no longer in the family, the house remains much the same as before with the massive live oak nearby and the huge magnolia (barely visible) in the side yard.



sisters and another sister lived nearby. Grandfather Adkins was a river pilot and "sometimes he would fish," Miss St. George said. "He was one of the best men I've ever seen . . . He was a good man." He and the young Bobby were close.

Her own memories of the writer are few and fleeting. "I didn't see him much. He'd come over here once in a while. But he never stayed still long enough to talk to." She wasn't surprised at the way he turned out, however. "I didn't know what to expect. I knew he was so smart until I wasn't surprised."

The old Adkins home is on Lord Street. Betsy Fulcher, a Wilmington resident who is "some kin somewhere" to Ruark, points out that Lord runs close to two other major Southport arteries: Howe Street and Dry Street. A neighborhood described as "Lord, how dry" is an ironic association for Ruark.

Mrs. Fulcher saw him last in the kitchen of a mutual relative called "Aunt Mae." She had dropped by to leave her copy of *Poor No More* to be autographed when Ruark arrived later that day. It was 8 a.m. and she was sitting at the kitchen table with a cup of coffee. Ruark walked in. "He didn't say hello or good-morning or whatever. He said 'where's the Scotch?' " He was "the typical playwright like you read about."

Finally Mrs. Fulcher was introduced and family connections were explained. "He said, 'That deserves a kiss,' " she remembers. "So I got a kiss from the famous Bobby."

She also recalls that same Aunt Mae's dismay over what to do when she got one of the first copies of *Poor No More*. Aunt Mae said she couldn't give it to anybody because they would pick themselves out, Mrs. Fulcher said. "You could," she added. "We had a great time."

There is still some lingering resentment of Ruark in Southport, Mrs. Robinson thinks. She attributes it to jealousy. "Southport doesn't go for Bobby too much," she said. "You know he made it so quickly."

The place he actually lived was Wilmington. One of his homes was on Nun Street, in a downtown neighborhood that has largely been restored. The big grey house with white trim is marked as a place where the "famous newspaper journalist and novelist" spent some of his early years. It was here that his next door neighbor Mrs. Mary Black Davis pushed him off the porch when they were kids. He wrote about it in the book *The Women*.

She remembers him then as "just like anybody else. Just another neighborhood boy." She remembers that "his mother made the best fudge I've ever put in my mouth."

Not all the memories that Wilmingtonians have of Ruark are as innocent and easy as his mother's fudge. Heavy drinking is associated with Ruark later.

Whatever his problems were then, in high school he was known as "sort of carefree and lackadaisical." He was "jolly," according to Mrs. Zula Hedman Metts. And he

---

I feel real sorry for people who never had a chance at broiled bluefish or mackerel when the fish is so fresh you have to kill him before you clean him. Some say that blues and mackerel are too fat and oily, but there are some people who don't like snails or oysters and think carrots are just dandy.

When the autumn came to our coast, just a little ahead of the quail-shooting season, when all the summer visitors went away from Wrightsville Beach and the gray-shingled little beach houses had their windows tacked shut against the northern gales, when the skies got as gray as the shingles and a wood fire was nice at night and all the little shops closed for the long, unprofitable off season—that was when the Old Man and I got into big business with each other.

was always drawing cartoons. He was the art editor of the annual. The description of him in the annual his senior year was "world's best pal, cartoonist, brown eyes and curly hair." He had no reputation as the writer he turned out to be.

Said another classmate of his success, "I was surprised at anybody in our class that did anything like that. I was equally surprised that he supposedly drank himself to death."

Ruark went from New Hanover High School to UNC in Chapel Hill. He was a member of Phi Kappa Sigma fraternity. In a newspaper column he remembered the campus as "a place of pastoral calm, with the silence broken only by the screams of the coeds as the boys chased them through the arboretum . . . Any learning that rubbed off on us was largely accidental."

He got into a journalism course because of a girl who was taking the course. Some interest in the subject did rub off. He went to Hamlet to work and later to the *Sanford Herald*. After a stint as a merchant seaman, he returned to newspapering, with a copy ~~boy~~ job on the *Washington Star*. Not long after that he became a sportswriter for the *Washington Daily News*.

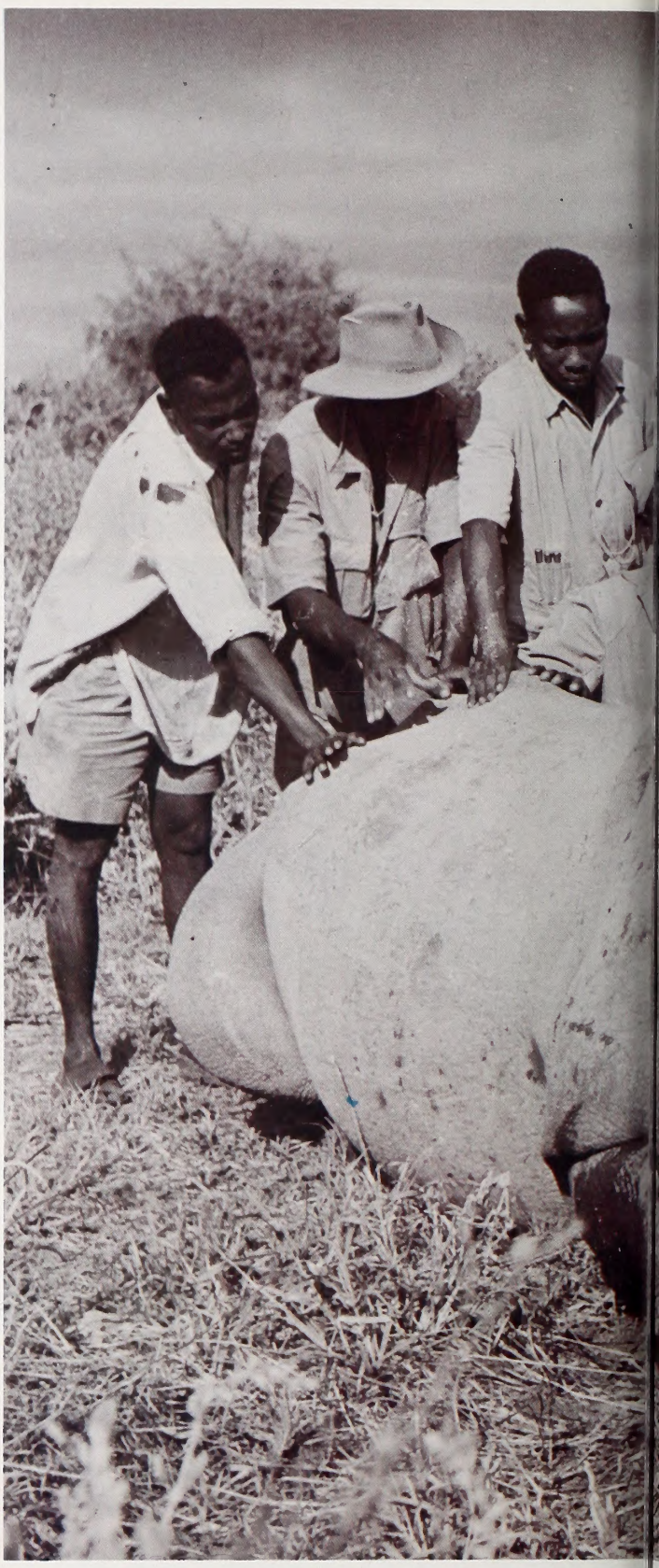
It was as a sportswriter that he got his first national attention. He offered pitcher Bobo Newsom some personal criticism in print. Then when Newsom called Ruark some names, Ruark hauled off and hit him. "I swear," Ruark later wrote, "he didn't even drop the Coke he was drinking." But the story was on the way across the country. "This impressed on Ruark," said a *Life* magazine profile, "the advantages of swinging hard, even if sometimes high and wide, at more or less important targets."

After three war years as a naval officer, he came back to journalism, writing features for Scripps-Howard's Washington Bureau. When the target he took on there was the way American women were then dressing, he wound up with a syndicated column that was often about things he didn't like. He had, according to *Reader's Encyclopedia Of American Literature*, "a facile gift for expressing aversion amusingly."

Within a couple of years of coming back from the war his column was earning him more than $50,000 a year. In an interview at the time he said this success in the column was because "I've been a typical Joe all my life. I believe that anything that makes me sad, glad, or mad has the same effect on a lot of other people." He lived in New York with his wife Virginia, a former Washington interior decorator, and wrote columns in big batches.

Then he turned to books and to Africa. His first book

Field and Stream



Robert Ruark was fond of big game hunting in Africa, and he shot this rhino on one of his safaris in March 1954 with the help of professional guide, Harry Selby (kneeling at right). Ruark wrote about these hunts and about

Selby in *Horn Of The Hunter* and *Use Enough Gun*. His safaris also led to other best sellers, including *Something of Value* and *Uhuru*. Contrary to popular opinion, market hunting and loss of habitat — not sport hunting — has been largely responsible for the decline of Africa's wildlife, yet modern safaris are now mostly photographic and the heyday of trophy hunting on the dark continent is over.

Although Southport has changed some since Ruark's youth, there is still a bench for idlers and serious thinkers near the waterfront, and the town has retained a good bit of its charm. The ship is the retired Frying Pan Shoals

Peggy Payne

lightship. Most of Ruark's *The Old Man And The Boy* was written about the area in and around Southport.

was a satire of historical novels, *Grenadine's Etching*. Several volumes later he decided to try big game hunting and wound up writing about racial conflicts. *Something Of Value* was his first big book success.

He turned out finally a dozen books, ranging from Africa to Wilmington and Southport in their subject and locale. The author himself retreated to Spain, to a "castle" at Palamos near Barcelona. He and his wife divorced. His wealth and his adventures became legendary — at least to any ten-year-old he dropped in on when he came back to Wilmington.

Robert Ruark died a few years after that visit, at age 49 in London, from internal bleeding. At the time of his death, according to wire stories, he had been planning to marry Marilyn Kaytor, food editor of *Look* magazine.

Poor No More is Ruark's book about a North Carolina boy who makes it big. It ends with this sentence: "How very rich he'd be, Craig suddenly thought, if he owned anything except the million dollars waiting for him in Switzerland."

The old Cedar Bench still hung together, but flimsylike, because it had been whittled at until parts of it were no wider than your hand. It had so much aimless knifework on it that the Old Man once remarked that if you sat long enough on enough sections of it your behind would eventually be engraved with the initials of everybody in town who was over fifty years old.

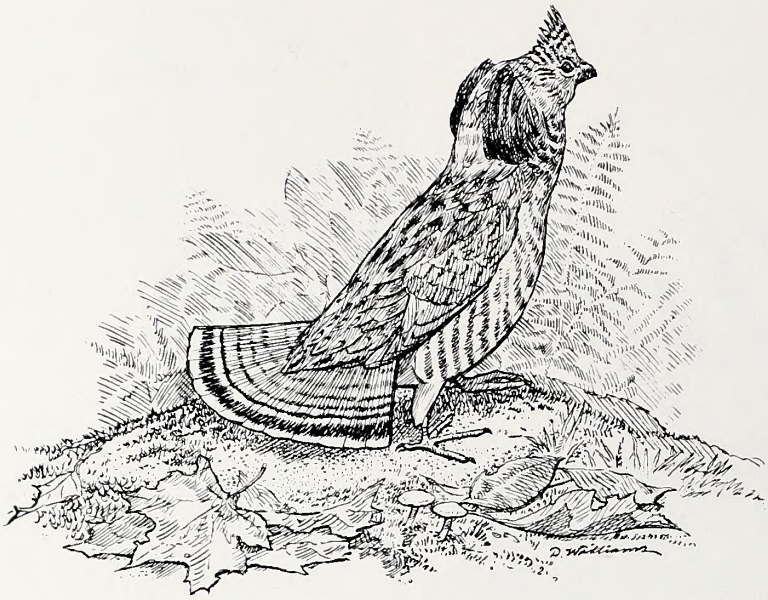
"The thing about fishing," the Old Man said, "is not how many fish you catch or what kind of fish. I, for one, think that making a hardheaded profession out of fishing is a waste of time, because a fish is only a fish, and when you make a lot of work out of him you lose the whole point of him."

"I ain't got to tell you that I am going to die," the Old Man said. "You would know it. You've had the best of me, and you're on your own from now on. . .

"I promise you," he said, "on my word of honor, I won't die on the opening day of the bird season."

Peggy Payne is a freelance writer from Raleigh, and a frequent contributor to WILDLIFE IN NORTH CAROLINA. She has a vivid memory of the day Robert Ruark visited her family on a return trip to Wilmington at the peak of his writing career.

All quotes from *The Old Man And The Boy* by Robert Ruark. ©1953, Holt, Rinehart and Winston, N.Y.



High among the peaks in the land of the noonday sun awaits North America's most challenging game bird,

the ruffed grouse.

By Curtis Wooten

Bill and I strolled leisurely along the old logging road, enjoying the crunch of newly fallen leaves under our feet and admiring the spattering of reds, golds, greens, and browns that littered the forest trail. Sunlight filtered through the thinning canopy, speckling the forest floor.

Bill Bonner, my hunting partner, is a grouse hunter's grouse hunter. He lives in Franklin, in Macon County, and knows the ridges and coves of his home and adjacent counties better than most of us know our own backyards. He's one of the few grouse hunters I know who consistently bags the three per day limit of grouse. In a sense, Bill's expertise at hunting is ironic since he is special projects fisheries biologist for the Wildlife Resources Commission.

As we walked through the woods, the dangdest racket you ever heard broke loose somewhere in the vicinity of the dog. It sounded like a helicopter trying to take off in a sapling thicket. Twigs were snapping, feathers were beating against limbs and leaves were flying. It was almost as unnerving as stepping across a barbed wire fence into the middle of a covey of quail.

Suddenly, a brown bundle of feathers about the size of a football exploded from amidst the furor and headed for a hole in a solid screen of rhododendron and hemlock branches a few yards away.

With the same composure that I usually show on a covey rise, I flung the old Ithaca to my shoulder with the barrel aimed somewhere in the vicinity of the brown bomb and fired almost in unison with Bill. A shower of red, gold and green flittered to the ground as the grouse burst through the break in the cover and out of sight. Bill fired another shot, blasting a shooting lane through the screen of hemlock branches, but leaving the grouse unscathed. I had two more rounds in my pump, and normally I fire another round just to let a bird know that I have not been intimidated by his safe departure. However, the price of shells being what it is, I decided to let this bird bask in the glory of its achievement. Besides, Bill's parting shot had served the same purpose.

It was late October; the rich fall colors that paint the mountains were

Curtis Wooten

Charley Dickey

Lunch is a special time for grouse hunters. For a few moments, it's possible to forget the grueling climbs and the tangles of rhododendron and laurel that seemed so endless only an hour ago. You can sit in a blaze of autumn glory and admire the grouse that didn't get away.

past their prime on the lower slopes and some of the higher ridges were virtually bare. The grouse hunting season had been open for a couple of weeks, and we were on our first hunt of the season for the "king of upland game birds."

We knew we were getting started a bit early. Most serious grouse hunters don't even take to the woodlands until the leaves are down. They consider it an exercise in futility, but we figured, what the heck, the trip would be good conditioning for later trips; and even if we failed to bag a bird, we would undoubtedly flush a few. That would give us a starting point for later trips. Besides, like most hunters today, I have to hunt when I can, and I knew I might not get another opportunity for weeks.

For those of you who don't recall, last fall was dry; so dry that the forest fire danger was very high, and there was some discussion of closing the hunting season until rain fell. As you might suspect, those are not the best conditions for grouse hunting. We knew that when we started out, but decided to take our chances anyway. The appeal of freshly fallen leaves underfoot, slopes still asplash with color, crisp mountain air and a sparkling blue sky were more than we could resist.

We had hunted the better part of the morning, covering two or three ridges and flushing three or four grouse that were out of range. We both missed a rare overhead passing shot at a grouse as it sailed down the cove. The dog had flushed it from the ridge above us while we were taking a few minutes out for a cool drink from a mountain spring. Around lunchtime, we crossed a ridge, hit a seeded logging road and followed it to an old log landing where we met three elderly grouse hunters enjoying a leisurely lunch. A setter and pointer sat at their feet, attentively waiting for a morsel of food. Their third dog, a "drop" (cross between a pointer and a setter), dozed lazily in a splotch of sunlight nearby. They assured us though that it was a fine grouse dog despite its ancestry.

As with most types of bird hunting, there is considerable dissension among grouse hunting ranks as to which breed of bird dog is best suited for grouse. English setters have always been popular in North Carolina, but Brittanies are rapidly gaining in popularity. Some pointers are also used, but many consider their wide ranging habits a disadvantage in the mountains. I know a few people who hunt with German shorthairs, and have a friend in Newland who hunts with a Labrador Retrievor. He bags far more grouse every season than the average hunter.

Whatever the breed, a grouse dog must be trained to go on point at the slightest grouse scent and hold that point until instructed to move up (unless, of course, the dog is trained to work close as a flush dog, like the Lab or some spaniels). Hunting with a well-trained grouse dog means you'll get a lot of false points on birds that have walked out, fed and moved on. But it also means you'll get a lot of shots at birds that aren't spooked by a dog that locks up 20 or 30 yards back. Grouse have an extreme dislike for dogs breathing on their tail feathers and tend to run or flush wild when crowded. No mere quail dog will do here.

Bill and I stopped to chat with the old fellows. Though we had all traveled some distance to get to our hunting area, we found that we had some mutual acquaintances. One was a fellow that was in on a grouse hunt in the Sherwood area of Haywood County back in the late fifties when 76 grouse were flushed in one day. We agreed that it was likely an unofficial record for grouse flushes that stood little threat of being broken on this day. After a few minutes Bill and I moved on, crossing a ridge nearby and dropping into another cove. Though we heard a couple of shots from their general direction later on in the afternoon, we never did run into the other hunters again to find out if they put any birds in the bag. They were the only hunters we saw.

That's one of the nice things about grouse hunting in North Carolina. Competition for good hunting areas is virtually nonexistent. There are well over half a million acres of Wildlife Resources Commission game lands in western North Carolina that are open to the public. Most of those lands offer good to excellent grouse hunting. Grouse abound on private lands as well, and permission can often be obtained to hunt likely looking woodlots and abandoned orchards.

Magazines like this one seldom list specific areas that offer good hunting or fishing for fear of creating more pressure than the area can handle, and thereby destroying the resource, but there is little danger of that in the case of grouse. The roughness of the terrain limits the harvest. Though there are far more grouse in North Carolina's woodlands than most people realize, they are — and will likely be — the State's most underhunted upland game bird.

Some of the better known areas that offer good grouse hunting include the Cowee, Standing Indian and Wayah areas of Macon County, the Shooting Creek and Fires Creek areas of Clay County, the Sherwood area of Haywood County, the Rich Laurel area of Madison County and the Flat Top area of Yancey County. These are by no means the only areas that offer good grouse hunting though. Most game lands in and west of Henderson, Rutherford, McDowell, Burke, Caldwell, Wilkes and Alleghany counties offer good to excellent grouse hunting.

Early in the fall, the best bet for finding grouse is on the high ridges, particularly in and around the red haw thickets. Grapes are also a favored food of grouse, so grape clumps should always be hunted. The fruit of the bittersweet vine is relished by grouse and the birds are almost always found where it grows. Grouse are "edge" lovers so particular attention should be given to woods openings, field edges and the edges of clear cuts. Old, abandoned home sites, with their grape,

Curtis Wooten

Grouse hunting is still a lonesome sport in western North Carolina, and it is rare indeed to encounter other hunters. Unlike some outdoor sports which are becoming increasingly popular, grouse hunting is never likely to attract too many enthusiasts. The abundance of good hunting areas combined with the wariness of the ruffed grouse and the ruggedness of the terrain will see to that.

huckleberry, apple and other fruits, are usually gems, sometimes producing a brood of five or six birds early in the season.

Later in the season, when snow falls, your best bet is to hunt the laurel and rhododendron thickets. It's usually fruitless to hunt immediately after a heavy snow because grouse will often hole up for several days, not even venturing out to feed. But when the snow begins to break up, open spots on south slopes are often good for a grouse or two.

Much of the preferred habitat of grouse in mid-to-late season is found in and around creeks and branches. Some hunters take advantage of this and use topographic maps to plot their hunting courses. They stay 20-to 30-yards away from a stream and work up one cove and down another, paying particular attention to fields and old home sites. Many topo maps in use today date back to the 1930s and 40s; and for the knowledgeable map reader, they contain a great deal of information about potential grouse habitats. Another advantage of using topographic maps is that you can determine the slope of your hunting area and lay out a hunting course to fit your degree of fitness. Relatively level areas with good grouse hunting are available in the North Carolina mountains — but you have to look for them.

Regardless of your degree of stealth, a great many grouse flush wild. A.D. Harrell, an accomplished grouse hunter from Bakersville who has over fifty years of grouse hunting experience, wrote an article for this magazine back in 1965. In it he gave some good advice on locating grouse that sail away unharmed.

"If it (a grouse) flies up the hill, you can be pretty sure it came down 10- to 20-yards beyond the crest of the hill, then walked a few yards to cover that offered the most protection," he wrote, "and it will stay there until disturbed. If it flies around the slope of the hill, expect it to go from 175 to 200 yards. When such a flight occurs, don't expect to find the bird on the course of the flight path, but look for it about 75 yards above the course of its flight. It seems that when the bird decides to glide in for a landing, it flies toward the ground on the upper side; and in addition to the glide will fly several yards just above the ground before stopping. If a grouse flies down the hill, wave it good-by and forget it. It may well go into the next county before it stops."

You've probably figured by now that grouse hunting is not for everybody. In order to truly enjoy it, a hunter has to be in pretty good physical condition. And even then, he's likely to finish the day in the field with sore muscles including a few he didn't even know he had. For many though, grouse hunting is an obsession somewhat akin to that which afflicts trout fishermen, quail hunters, turkey hunters and those who pursue waterfowl.

Grouse season opens in North Carolina in a couple of weeks (on October 15-February 29). If you're looking for a challenging sport that can put a delectible dish on your table, grab a friend (preferably canine) and take to the mountain slopes of western North Carolina for grouse. I'll be there, but don't plan on seeing me or many other grouse hunters. The odds of our running into each other are — thank goodness — very slim.

Letters

Dear Sir:

Someone brought to my attention the picture in the July issue of WILDLIFE IN NORTH CAROLINA. It is a picture of my father's boat, "Jean Dale," although my daddy, Harry Lewis, swears she has never been in so dire need of paint. I was hoping you could send me a copy of the picture.

I think Bob Dance did a fantastic job in the article on Cape Lookout. Maybe if more people wrote articles like that, the government would do something to save our lighthouse.

The boat was named for my brother and myself, and I am very anxious to obtain a copy of the picture. I would appreciate any help you could give me.

Patty Jean Taylor
Harkers Island

We have received many requests for prints or reproductions of these Bob Dance paintings. But, as we stated in the last issue, none are available and all of the original paintings are in private collections. Other Dance reproductions are available and for more information, write: Remarque, Inc., 1412 Wiltshire Street, High Point, NC 27260. WILDLIFE IN NORTH CAROLINA will be using Bob Dance and other artists in the near future.

Dear Sir:

The August issue of WILDLIFE IN NORTH CAROLINA has certainly given me food for thought. Two articles in particular struck me.

The first was the article on smallmouth bass by Curtis Wooten. His message is unmistakably clear. Here is a fish that had almost disappeared because of man's irresponsible use of the land. Today, a thriving fishery is back because we have cleaned up some, but not all, of our past mistakes.

The second article was on the Eno River Association by Mark Taylor. His message is clear also. A doomed river was saved because a handful of dedicated people fought for what they believed in. Living in a democracy entails certain responsibilities, especially being informed and caring.

The message conveyed by these two articles together is also perfectly clear. Sportsmen and conservationists should fight for laws that maintain the integrity of our waterways and land. We have a right to clean, free-flowing rivers and healthy forests. It's always easy to come up with a dollar figure in terms of jobs and benefits to the community to show the advantages of damming a river or letting more industry in. But, it's a little harder to come up with a dollar figure showing the equally essential benefits of a soul-cleansing drift trip for smallmouth bass, or what it is worth to backpack along a mountain ridge and see mile after mile of rolling forested hills.

North Carolina now has many residents who fled other areas that received the "benefits" of heavy industry, commercialization and urban sprawl. Many of these people will tell you point-blank that it is not worth it. We owe it to our grandchildren to fight for zoning and laws that keep rivers clean and forests healthy.

Diane Perrault
Charlotte

Dear Sir:

There are a lot of people where I work that are interested in honeybees and how they work. Is there any possibility of an article on them in WILDLIFE IN NORTH CAROLINA? I have enjoyed this magazine.

Ronnie J. Maultsby
Delco

Thank you very much for your article idea and interest in the magazine. We have an article on bees planned for the future so watch for it in an upcoming issue.

Dear Sir:

I enjoy the magazine, but will you please tell me why so much of our WILDLIFE magazine is devoted to things other than wildlife? The cover this month features flowers. I have nothing against flowers, in fact I make part of my living selling plants and bulbs. But there is no excuse for flowers gracing the cover of a wildlife magazine when there are so many great wildlife artists and photographers in our State. The wildlife magazine should be devoted almost 99% to wildlife. There is no excuse for filling the magazine with articles on boating, roots and herbs, people, weeds and flowers. Are you unable to get good writers who know and like to write about wildlife? Surely not. North Carolina has an abundance of wildlife, too much to have its wildlife magazine filled with trivial things as far as wildlife goes.

Do some repeats of articles which appeared years ago such as the Carolina parakeet, the passenger pigeon, etc. Run more photos and paintings of wildlife rather than people, unless that person is pertinent to conserving wildlife. How about an article dealing with our native Indians and their dependence and effects on our wildlife?

Such a magazine as you are putting out should be called Wonderful North Carolina, title copied from similar magazine published in West Virginia, or North Carolina Conservationist, title copied from former title of Tennessee Wildlife.

Bob Eanes
Lexington

Dear Mr. Eanes:

We appreciate your comments concerning WILDLIFE IN NORTH CAROLINA; and while we plan to continue to print many articles on fishing, hunting and wildlife, our effort to also include other related subjects is intentional. As our statement of purpose says on page one, we are "dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them." That includes boating, roots and herbs, people, weeds and flowers, as well as articles on fish, game and endangered species. We believe that it is very important to reach a wide audience so that more people will appreciate the absolute necessity of maintaining a sound future for all wildlife, and understand man's natural role as a hunter, fisherman and steward of these resources. Unless we broaden the scope of our articles, we cannot do this. We hope you will understand and continue to read and enjoy WILDLIFE IN NORTH CAROLINA. Incidentally, an article on how Indians hunted and fished is planned.

Dear Sir:

I've noticed a problem that disturbs me while fishing some Piedmont rivers.

Many fishermen, who don't normally litter, discard tangled bird nests of monofilament line in lakes or along a stream's banks. This practice is not only unsightly, but I once saw a herring gull slowly starving to death in a dump because it was hopelessly entrapped in a tangle of fishing line. I'm sure a similar problem confronts fish. It is a cruel way to go.

Wildlife doesn't deserve to die at the hands of a discarded "monofilament monster." So, tuck that tangled line in your back pocket and dispose of it where wildlife can't get at it or where someone else doesn't have to pick it up.

Ed Ramsey
Fayetteville

In the September issue of WILDLIFE IN NORTH CAROLINA, it was reported that a law had been passed by the State Legislature to require persons hunting deer with rifles in Camden, Chowan, Currituck, Dare, Pasquotank, Perquimans, Tyrrell and Washington counties to secure the written consent of landowners. This is incorrect. This law was not enacted by the Legislature.

Also, HB 675 was incorrectly reported. In Cleveland County, written permission is required to hunt with a centerfire rifle on land other than your own, and illegal to discharge a weapon from or across any state-maintained road or highway.

Albemarle Stripers Face Uncertain Future

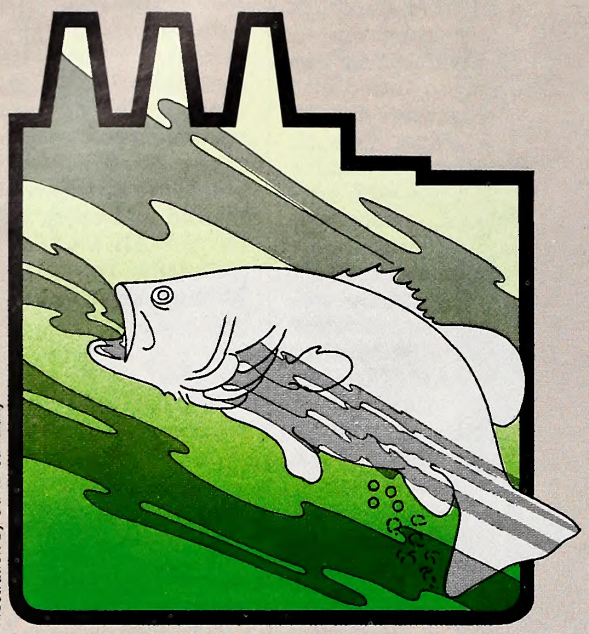


Illustration by David Saholsky

Albermarle Sound's striped bass have been the center of controversy for some time. Both commercial and sport fishermen claim the fishery is declining. A study by the N.C. Wildlife Resources Commission and the N.C. Division of Marine Fisheries shows that, while any recent decline might be normal, there is possible cause for alarm when looking at the future of Albemarle Sound's stripers.

The study shows that fishing success has declined since the early 1970s; but biologists have found that the late 1960s were banner years for striper reproduction, and formed the high point of normal fluctuating population cycles. Therefore, the lower populations seen since the mid-1970s are actually closer to the historic overall average.

Unfortunately, the study also reveals that there has been a drop in egg viability, and there is also a possibility that the sound's striper population may suffer from overfishing in the future.

Albemarle Sound stripers spawn in the Roanoke River. Dr. William Hassler of N.C. State University has studied striper spawning habits for many years under a grant from the Weyerhauser Corporation. In 1958, he found that 92 percent of the fish's eggs were viable, which means they were healthy and capable of developing after fertilization. Since 1975, the viability rate has dropped steadily from 55 percent to only 37 percent in 1978.

According to Tony Mullis, a Commission fisheries biologist who is working on the study, the drop in egg viability is probably linked to water quality problems. The fish could be affected by water quality in two different ways.

"One possibility is that something in the water is affecting the eggs after they've been released into the river," said Mullis. "Many different substances could do this. Another possibility is that the fish are picking up toxic substances that damage their reproductive systems. For example, among the possibilities are selenium, PCB's and heavy metals."

Skyrocketing fish prices also have biologists worried about possible overfishing since commercial fishing usually increases with rising prices. The wholesale price of striped bass was relatively stable for many years. Since 1975, the wholesale price for striped bass has risen from 50 cents a pound to a high of $2.50 per pound last summer. In some retail fish markets in urban areas, striped bass are selling for up to $5 per pound. Changes in fishing habits are also a problem.

"Pan-sized stripers are currently bringing the best prices," said Mullis. "A seafood wholesaler can get two single-serving sized fillets from each fish and they're easy to handle. One-year-old striped bass, which run from 10- to 14-inches long usually travel in large schools and are tempting targets for commercial and sport fishermen. Many of these fish, especially the females, are juveniles and have never spawned. If we overharvest these immature fish and continue to have egg viability problems, we could hurt the population."

Mullis and other biologists working on the study see two keys to protecting Albemarle Sound's striped bass fishery. The first is to identify what is causing the egg viability problem and correct it. The second is to make sure the harvest of young fish doesn't hurt the population. A management plan for the fishery is currently being drawn up.

Albermarle Sound's fish aren't the only stripers facing an uncertain future. The Chesapeake Bay striper population, which furnishes about 90 percent of the stripers on the Atlantic coast, has declined drastically due to pollution. The Hudson River population, which forms the second largest striper population on the East coast, has suffered severe losses from PCB pollution.

New Bill Would Benefit Boaters

A bill was recently introduced into Congress that would earmark boating fuel taxes for boating safety programs and the development of public boating facilities. These fuel taxes are now paid into the Land and Water Conservation Fund.

Under the new bill (HB 4310), $20 million would be available to states every year on a matching funds basis for the construction of boating facilities. The new bill would not impose any new taxes on boaters, but would merely divert existing tax funds into alternative uses.

Another $10 million would be available to states on a matching funds basis to support boating safety programs. These safety programs have been partially supported by Federal funds through the Boating Safety Act of 1971; however, this program was not funded for the upcoming fiscal year.

Officers Check Over 45,000 During June

For the month of June 1979, the N.C. Wildlife Resources Commission checked a total of 32,545 hunters and fishermen and 12,925 boaters.

Of the hunters and fishermen, 1,205 were prosecuted and 1,114 convictions were obtained. The total fines collected were $5,724 and the total costs collected were $27,639.

Of the boaters, 666 prosecutions were made and 618 convictions were obtained. Total fines collected were $1,305 and total costs collected were $14,441.

Other prosecutions totaled 40 and convictions totaled 38. Total fines collected were $510 and total costs were $918.

All fines and any arrests or witness fees are paid into the school funds of the counties in which the violation occurred, and no fines or costs are paid to the N.C. Wildlife Resources Commission or its personnel.

Investigation Seeks Answers To Bobcat And Otter Behavoir

North Carolina's bobcats and otters are being watched.

Researchers at N.C. State University are livetrapping bobcats and otters and equipping them with radio transmitters throughout the State to learn more about their habits, populations and needs.

Research Associate Doug Miller and Research Assistants Dennis Hazel and David Woodward of the State Zoology Department have livetrapped three Coastal Plain bobcats and equipped them with radio transmitters. The researchers take turns checking on the locations of the animals at regular intervals around the clock, and have come up with some interesting preliminary data.

"We've found that bobcats are active during both day and night, but most of their activity takes place at dawn and dusk," said Miller. "The cats tend to sleep and rest in heavy cover during the day but will still occasionally move about and hunt in daylight hours."

The telemetry work has shown that the cats have a range of two- to four-square miles and use three different types of habitat. They tend to den and hunt in river bottoms, use mixed hardwood and pine sites for hunting, and hunt extensively in old clear-cut and new pine plantations where small game densities are high.

An important part of the project has been the food study. The researchers have examined the stomachs of over 200 bobcats furnished by trappers and found rabbits to be the number one prey species. Cotton rats also made up a large portion of the animal's diet. The remains of deer were also found in many bobcat stomachs, but don't jump to conclusions.

"A lot of deer remains found in bobcat stomachs may have come from dead animals that have been scavenged," said Miller. "Bobcats are opportunists and will kill a deer if the opportunity presents itself, but they don't take many. A healthy deer is more than a match for a 16-pound bobcat. Predators tend to rely on readily available animals that are easily killed in large numbers for their primary food source."

The team is also studying otters and feels they may make short, seasonal migrations.

"We've noticed that otters on the White Oak River move up into the headwaters and feeder streams during the summer," said Woodward. "Many oldtime trappers told us this was normal. This is just speculation now, but we're looking at water quality to see if some factor like temperature or acidity might prompt the move. If this is so, then otters could be considered an indicator of a healthy environment and the lack of the animals could be interpreted as a warning signal."

Hazel is also determining available bobcat and otter habitat throughout the State by the use of Landsat satellite photos. After the group determines what bobcat and otters need, they can look at satellite photos of the State and determine how much suitable habitat there is. The photos could also be used to pinpoint areas that would meet the habitat requirements for introductions of the animals in the future.

The research is part of a joint project directed by Jay Hair and Dick Lancia of N.C. State University and Denny Baumbarger of the N.C. Wildlife Resources Commission. Much of the concern over bobcats and otters has been prompted by skyrocketing fur prices in recent years. Prime bobcat pelts from the North and West are bringing up to $500 apiece. North Carolina bobcat pelts average $60 apiece. The harsh winters of the North and West produce a finer fur than the warmer winters of the South.

"By learning more about bobcats and otters, we can find out how trapping is affecting the animals and ensure that there will always be plenty of bobcats and otters in the future," Miller concluded. "Trappers have been very cooperative in giving us bobcat and otter carcasses for our research. We appreciate their help and look forward to their continued cooperation in the project in the future."

Small Game Prospects Good

Small game hunters should have a better season this fall according to game biologists with the N.C. Wildlife Resources Commission. Small game species seem to be increasing their populations, or at least holding their own, throughout the State.

Biologists report that rabbit populations seem to be higher now than for the last several years in the Piedmont and Coastal Plain. Reports from the mountains indicate that rabbit populations are stable, but haven't shown the increases found in the rest of the State. Rabbit season runs from November 17 to February 29. The bag limits are five per day with 10 in possession and a maximum of 75 per season.

Quail populations are also apparently holding their own in the Piedmont and Coastal Plain, and the population in the mountains is also stable. The quail season opens on November 17 and runs through February 29. The bag limits are 10 per day with 20 in possession and a maximum of 100 per season.

The outlook for squirrels is especially good this year. Squirrel populations are high throughout the State, and some areas are actually overpopulated. The high squirrel population is directly related to the heavy mast crops produced by hardwood trees for the last several years. Still hunting is an effective way to take squirrels; but for some real sport, try floating small rivers and streams for bushy-tails.

The squirrel season opens October 15 and runs through January 31. The bag limits are eight per day with 16 in possession and a maximum of 75 per season. In Bladen, Cumberland, Duplin, Harnett, Hoke, Johnston, Moore, New Hanover, Onslow, Pender, Richmond, Sampson, Scotland and Wayne counties, the bag may include one fox squirrel per day with two in possession and a season maximum of 10.

Ken Taylor

Four new members of the N.C. Wildlife Resources Commission recently took the oath of office. From left to right are Conrad Duncan, Jr., of Stoneville, representing the State Senate; Dan Robinson of Cullowhee, representing District 9; Henry "Buck" Kitchin of Rockingham, representing District 6; and J.E. Lambeth of Thomasville, representing the State House. Not pictured is David L. Allsbrook of Scotland Neck, who was recently appointed Commissioner of District 3.

Hunters Have Own Patron Saint

Did you know that there is a patron saint of hunting? His name is St. Hubertus and he lived in Germany almost 1,300 years ago.

According to legend, Hubertus was out hunting on Good Friday in 700 A.D. shortly after his wife died when he had a vision. An albino red stag appeared before him with a crucifix burning between its antlers. The deer asked Hubertus why he shot only the best stags while hunting. Hubertus thought it over and had no answer. The stag pointed out that soon there wouldn't be enough truly prime stags to breed a healthy population if hunters shot only the largest and healthiest animals in the herd. Before disappearing, the stag went on to suggest that hunters should take some of the weaker stags if they hoped to maintain a strong deer herd. (Biologists say this is sound biology today, and it is also one reason for either-sex deer seasons where needed).

Hubertus believed that God had spoken to him through the great stag, and was so stuck by his vision that he decided to become a priest. As a priest, he taught conservation to other hunters and his message soon spread throughout the land. In time, it became the basis for the strict code of ethics practiced today by German hunters. When Hubertus was on his deathbed, he asked his brother priests to "stretch the pallium (a clerical vestment) over my mouth, for I am going to give back to God the soul which I received from him." Today, German hunters practice a similar ritual with the game they shoot. They place a small evergreen branch in the mouth of the fallen animal in the offering of the "last bite." This is a salute to the animal and symbolically gives back to God "the soul received from him."

Use Farm Chemicals Carefully

Rachel Carson's book, *Silent Spring*, was the first successful mass media attempt to point out the widespread danger of chemicals in our environment. Since then, there has been a running controversy concerning the worth of petrochemicals. Although many chemicals are being banned from the market, new "wonder products" guaranteed to cure almost any problem appear almost daily.

While it is true that most chemicals on the market are relatively safe when properly used, even those thought particularly innocuous can be deadly under certain circumstances. A chilling example of this was discovered recently by Denny Baumbarger, a N.C. Wildlife Resources Commission biologist from Elizabethtown.

"A landowner called me saying he had discovered two dead rabbits and a dead hawk in a newly planted corn field," said Baumbarger. "He was concerned and wanted me to try to determine what caused their deaths."

Baumbarger found the two badly decomposed rabbits and red-tailed hawk at the site and collected them for analysis. But another observation he made points out the deadly nature of man's products.

"As the landowner and I were watching the carcasses, flies were landing on the dead animals," he said. "Suddenly, the flies began falling to the ground and dying. I became alarmed at the apparent toxicity of whatever was causing their deaths because the ground around the carcasses was black with dead flies."

"Laboratory analysis indicated the hawk had died from Furadan poisoning, and stomach contents indicated it had eaten one of the contaminated rabbits," Baumbarger said.

Baumbarger surmises that one of the rabbits picked up Furadan, which is a widely used nematocide designed for controlling nematodes in a variety of crops. He believed that the rabbit thrashed about in its death throes attracting the hawk. The hawk killed its prey and fed upon it, paying dearly for its vigilance.

"It's very important to follow the directions on the labels of agricultural chemicals," said Baumbarger. "Although these chemicals are a great benefit, they can also be extremely deadly under certain circumstances."

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Nature's Ways

Who Paints The Leaves?

written and illustrated by Duane Raver

If there is any one season when nature outdoes herself, it has to be autumn. Of course, the soft greens of spring sprinkled with bursts of white dogwood and other bright flowers are welcome each April and May, and summer with its fire pinks, daisies, butterfly weed and dozens of other wildflowers furnishes plenty of color. Still, the fiery foliage of fall is perhaps nature's finest hour.

Some of the magic of autumn's beautiful transformation is lost when you scientifically pick apart the whys and wherefores of the color change, but let's do so anyway. For one thing, it isn't the swift brush of Jack Frost that splashes on the reds and golds. Actually, an early frost will lessen the show considerably.

The process is far more complex than a few chilly nights and the sudden appearance of reds and yellows. It starts with the very content of the leaves themselves. Chlorophyll — the miraculous green substance that converts water, carbon dioxide, various minerals and abundant sunlight into sugars — is quite unstable, and must be renewed by nature almost constantly. In addition to the greens in the leaves, two yellow pigments, carotene ("carrots"), and zanthophyll are abundant but hidden by the greens for much of the year.

As daylight hours become fewer in early September, the chlorophyll begins to break down and the more stable yellows prevail. Reds are produced by another fairly persistent material, anthocyanin. The interactions of the three basic materials along with the steady fading of the greens, produce the wide range of orange, bronze, purple and other hues.

Sourwood is perhaps the first to yield to nature's brush; and even in August, dark reds seep into the long, pale green leaves. Dogwoods, like those at the left of our flying grouse, respond in September and October, starting (as most fall foliage does) in the mountains and spreading to the coast. Ideal conditions for the most brilliant hues seem to be a warm, dry summer, followed by fall rains which prevent the early loss of leaves. The dryness of late summer and early fall favor the reds, while excessively wet weather can minimize the whole show.

Sugar maples, sassafrass, sweet gum, tulip or yellow poplar, hickory and dogwoods, all blend to blanket the State with color. Sumac and other shrubby vegetation adds to the display with both leaves and berries.

When will the color be "at its peak?" The folks in the mountains usually keep the rest of us alerted to the best week or so. Whenever it comes, it's worth pausing to enjoy, if only in your back yard. Somehow the fall show seems fresh and different each year, yet there is a comforting consistency. And only nature can do it.

We sat there in the marsh, with the marsh smell coming strong on the breeze and the soft flakes of snow falling, drinking what was left of the coffee and eating the apples and Miss Lottie's cookies we had stolen out of the crock. The red-winged blackbirds had shut up, and there was only an occasional string of ducks flying low under the solid clouds. It was getting colder all the time.

"We had a pretty good morning," the Old Man said. "I thought you did pretty good for an amateur. I guess you feel like celebrating some; so I suggest you row the boat home. It'll calm you down."

The Old Man And The Boy by Robert Ruark.
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WILDLIFE IN NORTH CAROLINA

NOVEMBER, 1979

OCT 31 1979

By Jim Dean

The Invisible Assassins

There was a time when a thunderhead on the horizon signaled nothing more ominous than an approaching storm. At the very worst, there might be some wind or hail and local damage to crops or property. The rain itself was often a blessing. There is increasing evidence, however, that some rains may be, quite literally, poisonous.

Joel Arrington

Mark Taylor's article, "The Rain That Kills," which appears in this issue addresses a problem that is a growing threat throughout the East including North Carolina. It seems that rain may no longer always nourish crops and forests, but harm them. It may no longer replenish soil and revitalize lakes and streams, but make them sterile. Rain water, long a symbol of purity, in fact often carries so much sulfur, nitrogen and other air pollutants that it can be deadly.

One of the most frightening aspects of this growing problem is that this form of pollution originates hundreds, sometimes thousands, of miles away in the industrial Midwest. To be specific, most of the acid rain that falls in North Carolina comes from industries in the Ohio Valley. It is hardly a welcome gift, but it points out again how truly small our world has become, and demonstrates that health threats seem ubiquitious.

There are so many of us crowded on this planet that virtually everything anyone does has an effect on someone else. Furthermore, the danger is often completely undetectible. You can't see the sulfur in rain water. You can't taste the radiation from a nuclear accident. You can't look at an oyster and tell if it is contaminated by organic pollution or tell that dairy products or meat are laced with some harmful substance. You may not be able to smell the poisons that leach into the ground and air from illegal chemical dumps. You are unlikely to know, until it's too late, whether there are asbestos fibers in your lungs which are causing cancer. The list of known threats could go on and on, and we have no idea how many other invisible threats exist.

Many people don't know, forget, or don't care that their actions can often have adverse effects on others. It might involve so simple an act as flushing the contents of an old can of DDT down the toilet in order to dispose of it. It never occurs to some people that this is a very efficient and dangerous way of releasing a deadly chemical back into environment. Where do they think that chemical goes? Will it wind up in someone else's drinking water? Certainly. Will they know it? Not likely.

An even worse example is the situation North Carolinians were confronted with last year when dangerous PCBs were dumped alongside 210 miles of our highways by a New York disposal company. Such a crime has great potential for harm to hundreds, perhaps thousands of people. A madman with a rifle might create more sensation by killing a dozen people, but he could never do as much harm as those who knowingly or unknowingly pump our world full of poisons.

Game biologists for the N. C. Wildlife Resources Commission found significantly high levels of PCBs in tissue samples of doves and rabbits which were collected in areas where PCB-laced oil was dumped along roads. PCB levels in some dove tissues averaged 90 parts per million which is about 18 times the maximum level of five parts per million allowed by the federal government in poultry and fish sold for human consumption. Rabbits averaged 95 parts per million, an even higher concentration.

Bob Hazel, executive director of the Wildlife Commission, bluntly states that this sort of finding represents only the tip of the iceberg. "There is so much that we don't know about how these chemicals affect wildlife or those who consume wildlife," he said. "This goes not only for PCBs and herbicides, but also for pesticides, heavy metals and other toxic substances."

Various types of poisons are also accumulating in your body and mine. It is not a very encouraging thought, yet many people seem unconcerned. "I can't worry about everything that might cause me harm," they say. "We've all got to die of something."

That kind of sentiment is not only foolish, it is also one of the main reasons we've let our environment deteriorate to its present sad shape.

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Front Cover *Few sights stir the soul of a quail hunter as deeply as the explosive rise of a covey of quail. Photographer Charley Dickey captured the peak of the action for this month's cover.*

Back Cover *The sun sets behind gathering storm clouds, and Joel Arrington's camera recorded the scene. Unfortunately, rain is at the center of a growing controversy over air pollution.*

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Charley Dickey

Charley Dickey

I Now Pronounce You Man & Dog

The relationship between quail hunter and dog is not unlike that imperfect, adversary contract called marriage.

By Jim Dean

I'm not quite sure what it is about a quail hunter that sets him apart from the rest of the human race, but I think it has something to do with dogs. If that sounds more like some kind of affliction than a relationship, you're perceptive.

In most forms of sport hunting, it is possible to pursue your quarry without the aid of a specially trained quadruped, but that is not the case if you are hunting the bobwhite quail (also known in the South as pa'tridge or quite simply as a "bud"). It is inconceivable that anyone would seriously hunt "buds" without a dog. It would be no less than an act of outrageous sacrilege, and indeed, the quail themselves are far more expendable than the dog. It is a routine matter to hunt without the participation of quail. I have done quite a lot of it.

Thus it follows that quail hunting is not an obsession with quail, but an obsession with dogs. A serious hunter may forget how many quail he killed on a given trip — or even who he hunted with — but he can always recall in great detail exactly what his dog did (especially the best), and what his companion's dog did (especially the worst).

I have been closely associated with many dogs over the years. Offhand, I can call to mind at least four English setters, three English pointers, three Labrador retrievers, two German shorthairs, one chihuahua, eight poodles — through a misun-

Hanson Carroll

Charley Dickey

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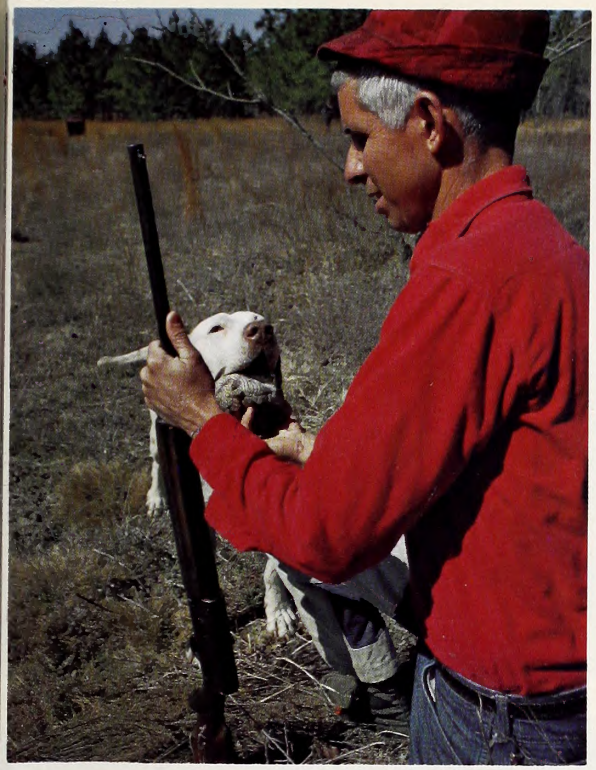

In every quail hunter's mind, there are visions of how it ought to be. The dogs find a covey in the edge of a field (below), and they hold their points while the hunters move up. When a kill is made, the dog finds the bird and delivers it to the hunter (near left). At the end of the day, hunters and dogs share the warm feeling of successful teamwork. That is the dream, and perhaps it is fulfilled frequently enough to make it all worthwhile. Alas, there are other days when everything goes wrong.

derstanding about which I promise no further comment — and an assortment of mutts whose indiscriminate and frequent dalliance was an inherited trait going back to the Second Ice Age.

You might guess that I love dogs, but that is an inadequate explanation. My relationship with dogs is more nearly like marriage; that is, an adversary contract. There are advantages to dog ownership, just as there are advantages to marriage, but no one would claim either is a perfect arrangement. That's something I understood almost from the beginning.

One of my earliest recollections concerning dogs goes back a long time. We — my grandfather, his boss and I — were standing in the backyard while Grandpa's setter Chief, who had just been let out of his pen, charged headlong around the yard, cutting grooves in the grass and ricocheting off the fences.

Grandpa and I finally rounded him up and dragged him over to stand inspection, whereupon Chief promptly lifted his leg and soaked the boss' pants from both knees down. It made a lasting impression on me, not to mention Grandpa and his boss. I distinctly recall wondering, even at that tender age, whether dogs were worth all the trouble. Two dozen dogs and 30 years later, that question is still up for grabs.

The relationship between hunter and dog is largely a mixture of love and exasperation, with a dollop of occasional pride. Stir that with the occasional urge to kill (the dog, not a quail), and you've just about got it.

Exasperation is one of the primary emotions engendered by a bird dog, and the well-known University of South Carolina English Professor Havilah Babcock made a career out of writing poignant and often hilarious accounts of the gentle war between dog and hunter before his death a few years ago. You need only read such Babcock classics as *My Health Is Better In November* or *Jaybirds Go To Hell On Friday* to appreciate his full understanding of the intricate relationship.

If you hang around bird hunters very long, you'll hear them say that they simply won't pay the feed and vet bills for any dog that won't carry his weight in the field. If this were a sincere statement, it would result in the immediate severance of ties between at least nine million hunters and their dogs.

My dad's situation is surely typical. He owns two bird dogs. One is an aging pointer named Buck; the other is a setter pup named Jake. Jake is going to be a fine bird dog someday, even though he is still more interested in "pointing" bugs than birds, but Buck is another matter entirely. He is undoubtedly the most lovable pointer that ever set four paws on the ground, but he is also at times the most unforgivable.

The problem is that Buck has never learned that Dad or I are part of the team. Buck hunts beautifully; but if we are hunting in Granville County, he thinks it is his duty to reconnoiter Vance and Person counties. There have been times when Dad and I saw Buck only twice during the day — when we turned him loose, and again when he returned long after dark.

Charley Dickey

One of the problems with modern quail hunting is that the birds themselves have changed their habits. A dog that points a quail on the ground with great intensity (left) is hardly prepared for the bird that habitually lands in a tree (right). An open field covey rise (below) is less common as more coveys spend their time in the woods and thick bottomlands. Even when birds feed in fields these days, they often fly in and out of the field, leaving no scent along the edge for a dog trained to run the perimeter.

Hanson Carroll

Dad has tried everything. Putting a 20-foot cord on Buck to try to slow him down is about as effective as trailing a shoelace behind a Sherman tank. We have put progressively larger bells on his collar so that we could at least hear him when he was blasting through the brush; but in order for any bell to work, it would have to come out of a cathedral.

Somebody once recommended a shock collar, and this worked great until Buck figured out the effective range of the collar. Buck hunts like a dream as long as he's within range of a jolt; but if he can endeavor to get within 50 yards of the outer limits, you can kiss him good-by. I've seen Buck suddenly bolt for the border in a cloud of dust, accompanied by a chorus of "whoas" and a steady current of electricity. You could jolt him until his hair stood out straight and he'd just grit his teeth and keep on trucking. It's a game to him, and you can almost imagine Buck thinking, "Just a few more yards and I'm free."

Still, you've got to balance this sort of thing with Buck's good points (no pun intended). The happiest I ever saw Dad was one brisk November day a couple of years back when he knocked down a quail in the thickest cover between Nova Scotia and Tierra del Fuego. We finally convinced Buck that a genuine miracle had occurred (that is, one of us had actually

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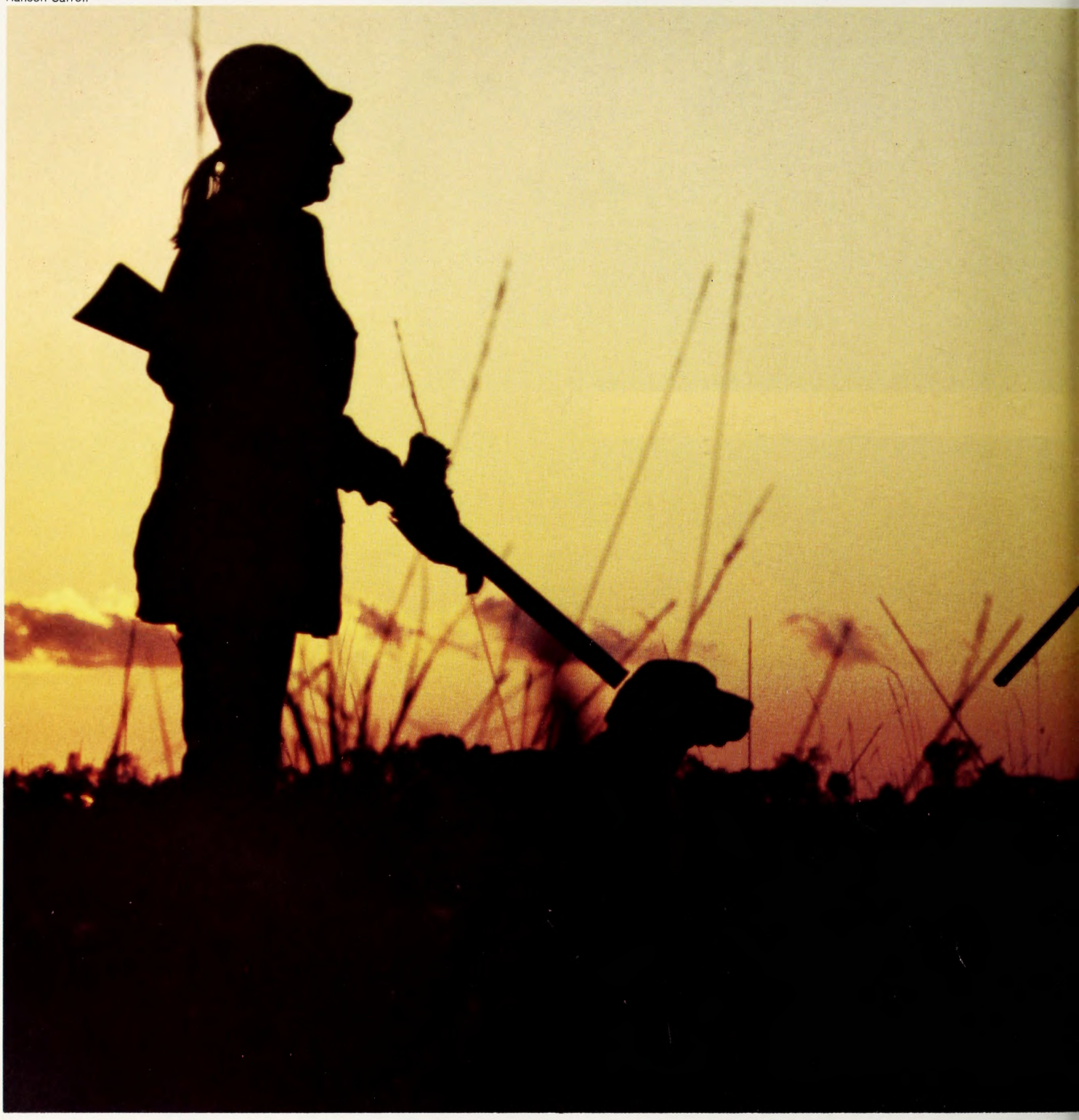


Despite the built-in frustrations of quail hunting, the rewards are still rich. Even the dog that runs wild most of the day, breaks points, and fails to retrieve consistently will occasionally perform with brilliance and joy. These moments, regardless how rare, are savored long after the failures are forgotten. Indeed, if hunters were not supremely selective in the memories they hold dear, the sport of quail hunting with dogs would have perished long ago.

shot a quail) and Buck began to half crawl, half bull his way into the virtually impenetrable tangle. For the longest kind of time, we could not see him, but we could hear Buck rummaging around giving an occasional yelp when the greenbriers got too familiar. After what seemed like an hour, Buck finally emerged looking as though he'd lost a fight with a cage full of cougars. In his mouth was the bird. Dad said, and I believe him, that he wouldn't take $1,000 for that moment.

I once enjoyed, or endured, a sustained relationship with a pair of bird dogs that had elevated frustration to an art form. They were masters of what you might call the "flying point." It usually went like this. At some point during the hunt, one of them would find a covey of quail and lock up into a magnificent point. Instantly, the other dog would be so overcome with jealousy that he would begin to creep past his companion. Both dogs would be watching each other as they tried to gain indisputable ownership of the covey. Within moments, they would both be running at full gallop, yet with a peculiarly graceful gate and tails high and proud as though they believed the birds would not be alarmed if style were maintained.

It is, of course, perfectly all right for me to refer to my dogs as the biggest nincompoops ever littered, but it is a monumental mistake for other hunters to assume that they can make the same observation in my presence. If my dog should happen to point a terrapin, it is proper etiquette for you to find some way to offset our mutual embarrassment. A snicker could cost you your life. This also works in the reverse. Should your dog leap into the middle of a covey or gulp a quail, feathers and all, I assure you that I will be discreet about this event — at least as long as you are still in sight.

If you are not a quail hunter, it may have crossed your mind that it takes a truly feeble-minded human being to choose such a lifelong obsession. I am not certain that I can effectively counter that indictment, but perhaps a recent event will put it into perspective.

When my family's German shorthair was killed by an automobile a couple of years ago, I stood over the fresh grave which the kids had covered with crepe myrtle. I was not thinking about the time that Covey had eaten a whole Thanksgiving ham and a loaf of white bread, wrapper and all. Instead, I thought how he had often pointed the gerbils which were forever escaping from their cage in the kids' bedroom. Sometimes, the only way you knew a gerbil had gone over the wall was when you found Covey standing proud and rigid over a pile of dirty socks in the midst of which would invariably be the escapee.

And I remembered how Covey looked running free and loose in the broomstraw and soybeans, his nose high to catch the scent of quail or sparrow, and his long ears flowing gracefully back towards his cropped tail which we always thought looked like a moldy cigar butt. That was Covey; a study in contradictions. He could be competent, yet comic; graceful, yet gauche; trained, yet undisciplined; obliging, yet frustrating; devoted, yet treacherous. Most of all, he was loving and loved, the way it is with all bird dogs — good and bad.

Don't think for a moment that a hunter would have it any other way.

The Rain That Kills

Acid rain caused by air pollution is affecting fish, wildlife, crops and forests throughout the east, and North Carolina is rapidly becoming a prime target.

By Mark Taylor

It's called acid rain. It blows out of the Midwest with the prevailing easterly fronts, falling in the Adirondack Mountains of New York, the spruce fir forests of northern Ontario, the White Mountains of Maine and New Hampshire, and the Appalachian and Great Smoky Mountains of North Carolina. In the raindrops and snowflakes are nitrogen and sulfur compounds spewed out by the steel mills, smelters, coal-fired generating plants and automobile factories of Ohio, Illinois, Indiana, Pennsylvania, Michigan and Ontario.

Photos by Ken Taylor

The compounds combine with water and sunlight high in the atmosphere to form solutions of sulfuric and nitric acid. Where the rain and snow falls to earth, fish die, soils deteriorate, crop yields decline, and the make-up of forest and plant communities slowly change.

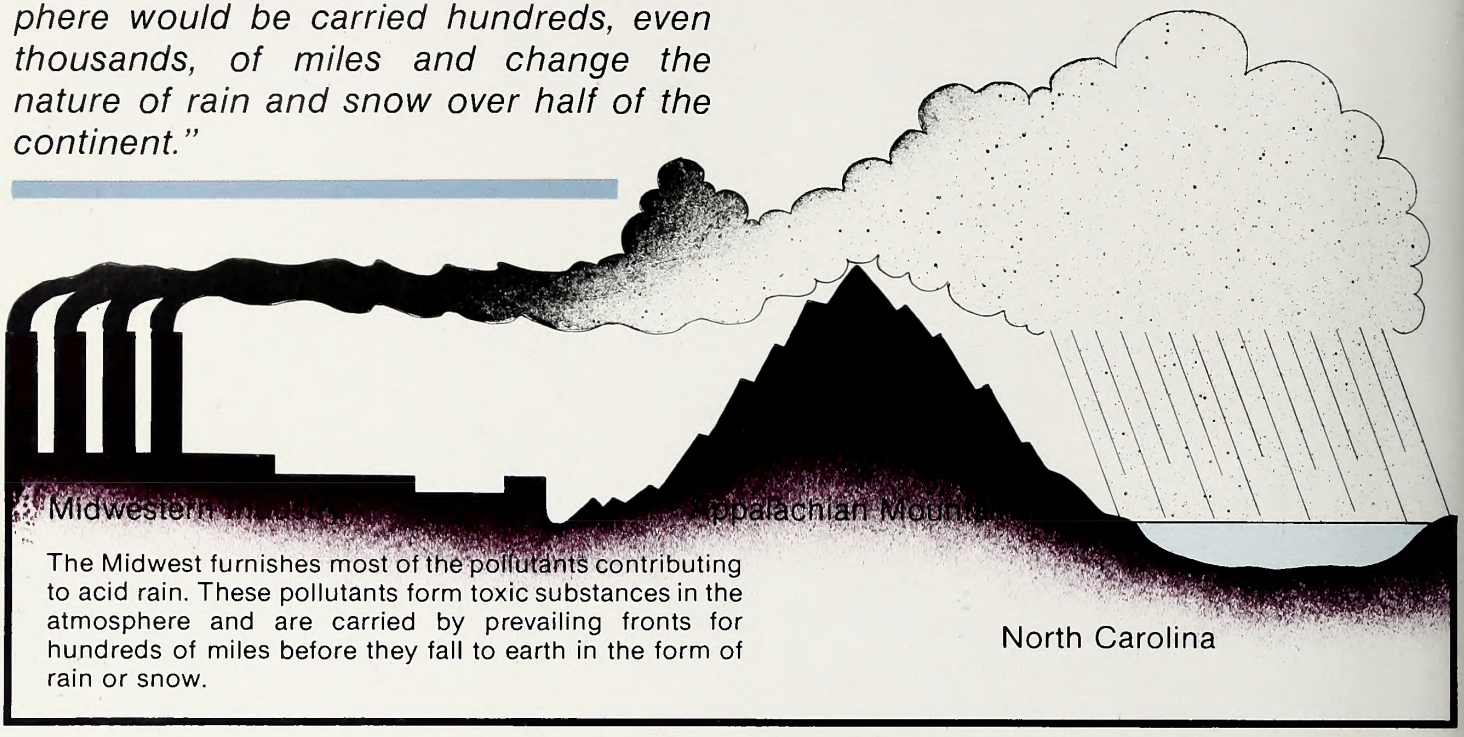
It's a long way from the steel mills of the Midwest to the log cabin in the Great Smoky Mountains National Park that serves Gary Larson and Ray Matthews as an office, but perhaps it's not far enough. The Park Service scientists are studying precipitation in the Smokies and are concerned with the changes they're seeing.

"If you look at a map showing the acidity of precipitation over the past 20 years, you'll see some frightening changes," said Larson. A pH of seven is neutral, anything above seven is alkaline and anything under seven is acidic. The pH of rainfall in the east should be about 5.8 because some acidity occurs naturally due to dust and carbon dioxide found in the atmosphere. In the past 20 years, the average acidity of rain and snow has dropped from a pH of 5.7 to between four and 4.5. This represents a forty-fold increase in acidity."

It's difficult to pinpoint the effects that the increased acidity of precipitation is currently having on North Carolina. The Adirondack Mountains of New York and the lakes region of Ontario offer the best examples of the devastation that acid rain can wreak. In the Adirondacks, a 1975 survey showed that 56 percent of the wilderness preserve's high elevation lakes were devoid of all fish life. Ninety percent of the Adirondack lakes with a pH under five — which is 110 out of the 219 lakes — were fishless! Surveys of the same lakes in the 1930s showed that only four percent were fishless and had a pH of less than five.

One New York biologist has predicted that "if acid precipitation isn't stopped soon, there won't be a trout left in the Adirondacks in ten years." The damage to Ontario lakes is even more severe. Currently, 148 of the Province's lakes are "dead" due to acid rainfall, with 80 percent of the pollution originating in the United States. Another 48,000 Ontario lakes will die within 20 years if the situation isn't corrected. In many lakes that aren't yet dead, acidity has increased the uptake of heavy metals in fish, often making them unsafe to eat. All this damage is also taking an eco-

"Industrialists never dreamed that the chemicals they pumped into the atmosphere would be carried hundreds, even thousands, of miles and change the nature of rain and snow over half of the continent."



The Midwest furnishes most of the pollutants contributing to acid rain. These pollutants form toxic substances in the atmosphere and are carried by prevailing fronts for hundreds of miles before they fall to earth in the form of rain or snow.

nomic toll. Over $1 million annually in tourism and fishing is lost in the Adirondacks because half the lakes are dead. Ontario is also very much concerned since sport fishing is worth almost $2 billion annually to the Province.

Matthews and Larson are conducting their own study on acid rain in the Smokies and are focusing on the effects on salamanders for some very good reasons.

"Most salamanders spawn in pools of standing water," Matthews said. "These pools are usually formed by rain water or melted snow, so it's a good bet that any problems would show up in salamanders first. Frankly, we're looking at salamanders because we expect to see some problems and we consider them an environmental barometer."

Could the Adirondack situation happen here? According to Larson and Matthews, the answer is "yes."

"Conditions in western North Carolina and the Adirondacks are very similar," said Larson. "Soils in both areas are usually shallow and acidic with low buffering capacities. Buffering capacity is a substance's ability to neutralize acidity."

"When the pH of a lake or stream goes below five, fish are affected," Larson added. "The acidity can kill fry outright and halt reproduction in older fish, which is what has happened in Adirondack waters. High acidity also increases the uptake of heavy metals in fish, and this also hurts reproduction. Therefore, you'll see an abrupt decline in fish populations, but nothing as dramatic as an outright fish kill. Unfortunately, fish aren't the only creatures hurt by acid rain. The acidity kills many other aquatic invertebrates, which affects wading birds and aquatic mammals which depend on fish and these creatures for food."

The pH of Adirondack streams and lakes is now permanently depressed. Western North Carolina lakes and streams show pH dips after major storms and snow melts, but are still able to recover.

"We see some of our lowest stream pH's in the winter," said Larson. "Many contaminants in the snow are flushed out in the first melt and we've measured snow with a pH of three, although it's usually around four to 4.5. Stream pH's will often go down to 5.8 for a short time. If this occurs at a critical stage in an organism's life cycle — say while fish are spawning — it can have long term impacts on wildlife populations."

Matthews and Larson have five stations set up at different elevations throughout the park where they're taking comprehensive observations of weather patterns, precipitation's chemical character and other factors. They are also measuring the pH of two streams on an hourly basis for reaction to major and minor storms from different areas.

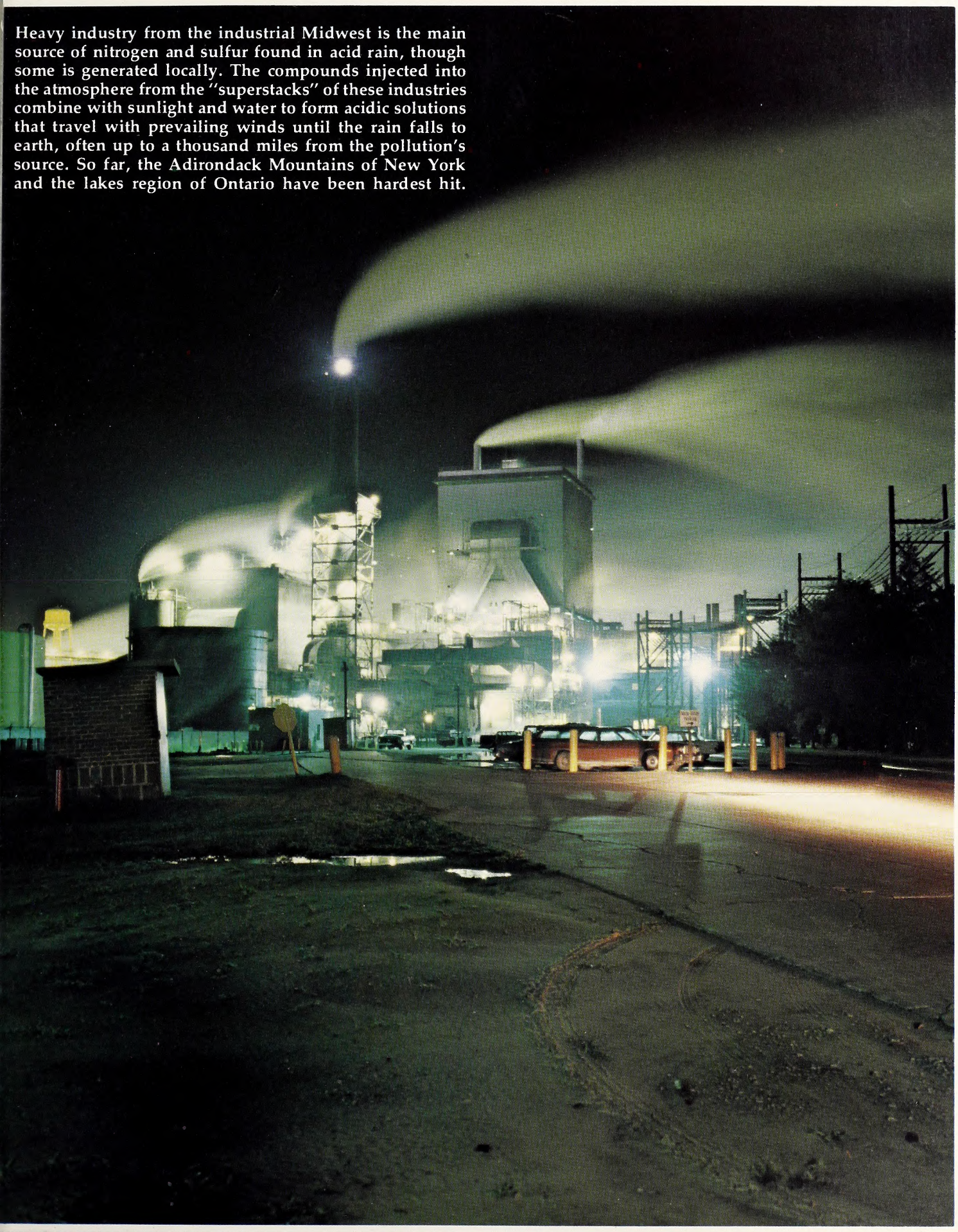
There are several areas of the park that are especially vulnerable to damage from acid precipitation.

"All high elevation areas, like mountain balds, are very susceptible to damage from acid rain," said Larson. "On high sites, soils are usually shallow and acidic to start with, and there's little foliage to neutralize the acidity of precipitation as it trickles to the ground. The same holds true with streams. Small, headwater streams are largely made up of runoff and have low buffering capacities anyway. In the interior of the park, and along the shore of Fontana Lake, there is a rock formation known as "Anakeesta" that we're particularly worried about. As Anakeesta weathers, it releases iron-pyrite and sulfur, killing fish, salamanders and other aquatic life. Acid precipitation increases geological weathering rates considerably, and we're concerned about heavy metals leaching out of these formations and running into Fontana Lake. The drops in pH in Adirondack waters have often been minor fisheries problems compared to heavy metal toxicity."

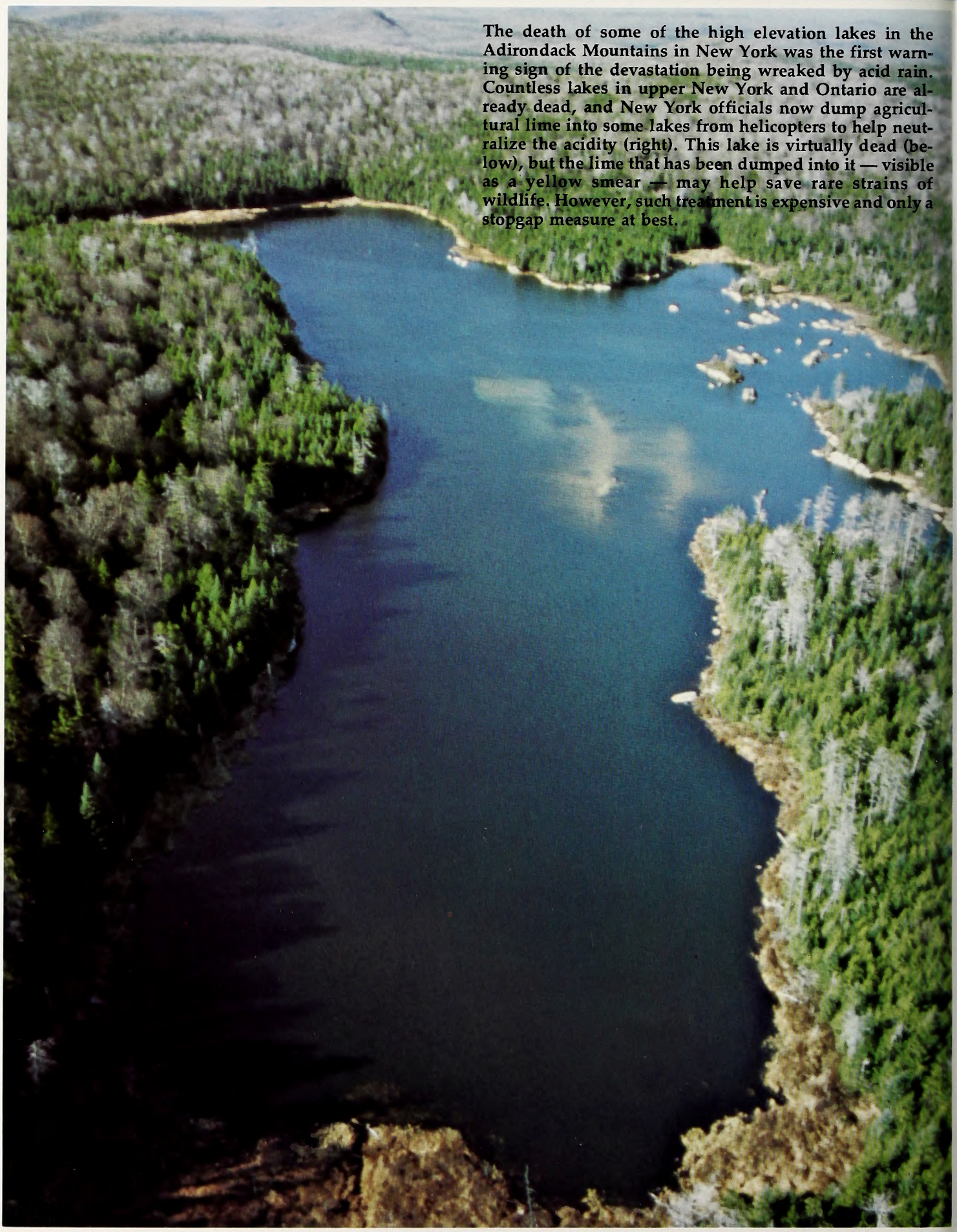
"The Adirondacks can definitely be considered a bellwether for what may happen here," Larson concluded.

illustrations by David Saholsky

Ken Taylor



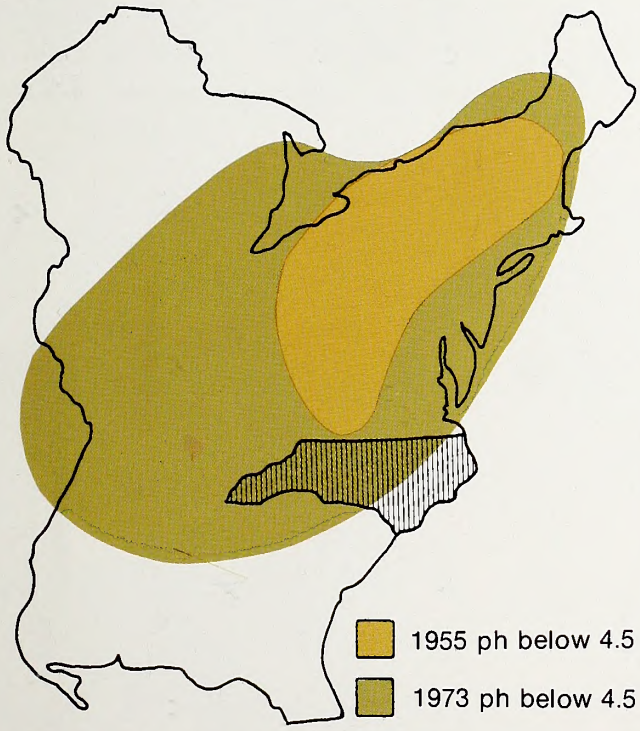
Heavy industry from the industrial Midwest is the main source of nitrogen and sulfur found in acid rain, though some is generated locally. The compounds injected into the atmosphere from the "superstacks" of these industries combine with sunlight and water to form acidic solutions that travel with prevailing winds until the rain falls to earth, often up to a thousand miles from the pollution's source. So far, the Adirondack Mountains of New York and the lakes region of Ontario have been hardest hit.



The death of some of the high elevation lakes in the Adirondack Mountains in New York was the first warning sign of the devastation being wreaked by acid rain. Countless lakes in upper New York and Ontario are already dead, and New York officials now dump agricultural lime into some lakes from helicopters to help neutralize the acidity (right). This lake is virtually dead (below), but the lime that has been dumped into it — visible as a yellow smear — may help save rare strains of wildlife. However, such treatment is expensive and only a stopgap measure at best.

John Georg, New York

John Georg, New York



This illustration shows how acid precipitation spread between 1955 and 1973. In 1955, only the portion of the country shaded in orange received precipitation having an acidity of pH 4.5. By 1973, the acidity of precipitation had dropped so that the area shaded in green was also receiving precipitation with an average pH of 4.5. In the Adirondack Mountains of New York, which have felt the effects of acid rain the longest, many classic wilderness trout ponds are now silent, sterile and fishless.

"Man has become a dominant influence on the quality of our planet's atmosphere. At the end of World War II, only a small part of the Northeast was affected by acid precipitation. Today, most of the eastern United States is affected by it."

"In the Adirondacks, a 1975 survey showed that more than half of the wilderness preserve's high elevation lakes are devoid of all fish life."

"Changes show up in aquatic systems first, and it may take 50 to 100 years to see dramatic changes in plant communities and other terrestrial systems. If things keep going the way they are now, we'll definitely have the same situation here as in the Adirondacks. Furthermore, changes will be felt more quickly and intensely outside the park where there's more development, and watersheds and forests aren't as well protected."

Dr. Ellis Cowling, associate dean of research at N.C. State University's School of Forestry, is also chairman of the National Atmospheric Deposition Program. This organization is a network of state and federal agencies working together to study airborne pollution. Larson and Matthew's work in the Smokies is part of this program.

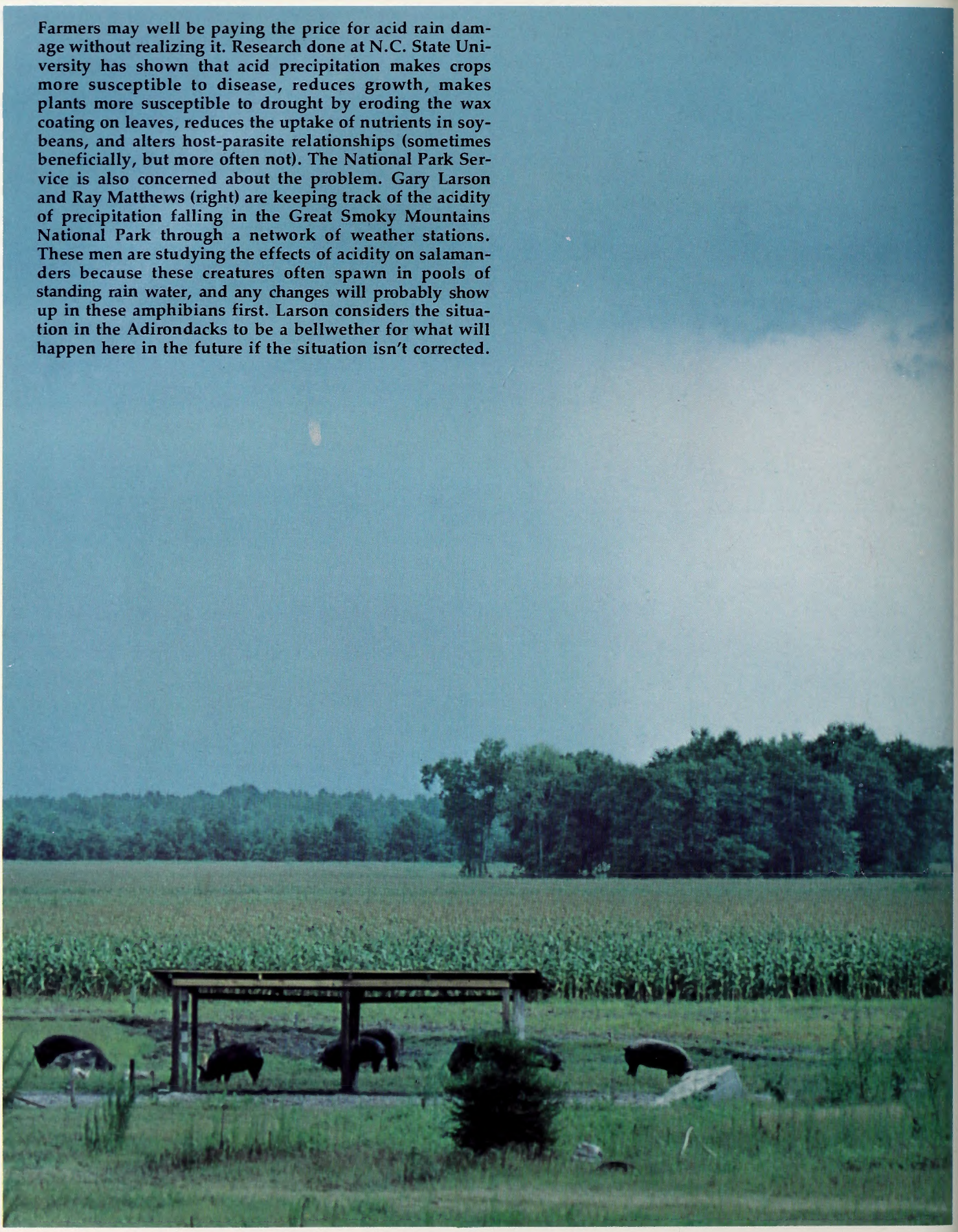
"Man has become a dominant influence on the quality of our planet's atmosphere," Cowling said. "At the end of World War II, only a small part of the Northeast was affected by acid precipitation. Today, most of the eastern United States is affected by it. For example, Ithaca, New York now receives three times as much nitrate nitrogen in atmospheric pollution as it did in 1945. Yet, we know very little about how this massive influx of pollutants is affecting our environment. The National Atmospheric Deposition Program is working with Agricultural Experiment Stations, the U. S. Geological Survey, the National Park Service, the Forest Service and other state and federal agencies to learn how atmospheric pollution affects forests, water resources, wildlife, crops and people."

The amount of pollutants released into the atmosphere is, indeed, massive. According to the Environmental Protection Agency, the United States releases 33 million tons of nitrogen and sulfur into the atmosphere annually. Canada adds another eight million tons. Most of the pollution comes from heavy industry, but automobiles and homes also contribute their share.

"When we first started studying acid rain here at N.C. State University several years ago, we set up a series of experiments at a pH of 3.2, which we considered unrealistically low at the time," said Cowling. "We've had five rainstorms in Raleigh this summer where the pH ranged from 3.28 to 3.75. Up until this time, only rain in some sections of the northeast had been this acidic. A pH of 3.3 is about the same as vinegar."

The research at N.C. State, using simulated rainstorms, found that acid precipitation had many effects on oak trees, soybeans, corn and kidney beans. Waxes on leaf surfaces eroded, making plants susceptible to drought.

Ken Taylor



Farmers may well be paying the price for acid rain damage without realizing it. Research done at N.C. State University has shown that acid precipitation makes crops more susceptible to disease, reduces growth, makes plants more susceptible to drought by eroding the wax coating on leaves, reduces the uptake of nutrients in soybeans, and alters host-parasite relationships (sometimes beneficially, but more often not). The National Park Service is also concerned about the problem. Gary Larson and Ray Matthews (right) are keeping track of the acidity of precipitation falling in the Great Smoky Mountains National Park through a network of weather stations. These men are studying the effects of acidity on salamanders because these creatures often spawn in pools of standing rain water, and any changes will probably show up in these amphibians first. Larson considers the situation in the Adirondacks to be a bellwether for what will happen here in the future if the situation isn't corrected.

Mark Taylor

"The entire eastern half of the nation is affected by acid rain. It is worse in the Northeast, but is an increasing threat to North Carolina."

"Researchers recorded five rainstorms in Raleigh last year which were as acidic as vinegar."

"Problems with acid rain are increasing, yet we are modifying laws to permit even more of it."

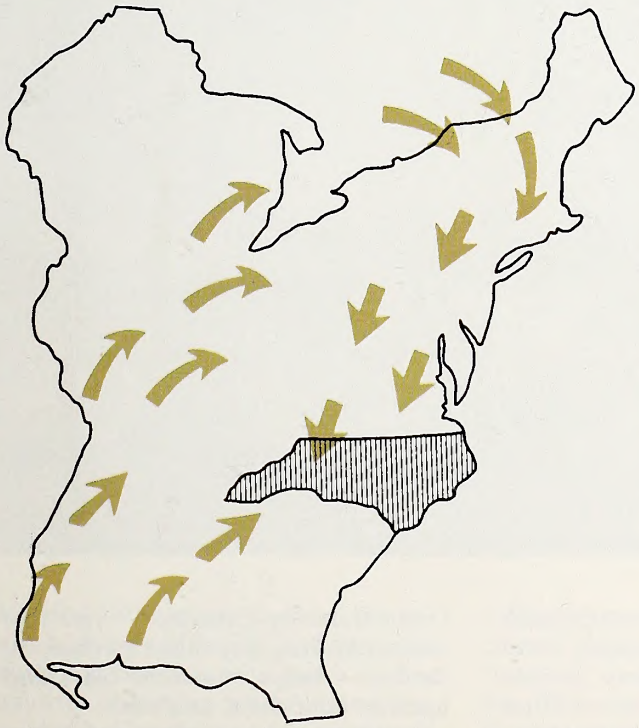
Nodulation on legumes was inhibited, reducing the uptake of nutrients in soybeans. Host-parasite relations were altered, sometimes beneficially, but more often not. The stress caused by the problem made plants more susceptible to disease.

"The Scandinavian countries have been studying acid precipitation for about 30 years since they have a severe problem," said Cowling. "They've seen forest production drop as much as seven percent on some sites. They've found that germination in many tree species is poor under acidic conditions, and acidity slows the breakdown of leaf litter resulting in nutrient poor soils. Acid rain also leaches nutrients out of the soil, and these nutrients wind-up in the ground water often beyond the reach of a tree's root system. They also observed the same problems that we found in our experiments."

According to the U.S. Weather Bureau, all of the five storms that had exceptionally low pH's this summer had passed over the heavily industrialized areas of the Midwest before reaching North Carolina.

The solutions to the problems of acid precipitation are at once, simple, and at the same time, very complex. Ironically, part of the problem was caused by short-sighted attempts to "clean up" pollution. Many industries erected giant "superstacks" at their factories during the 1950s and 1960s to "harmlessly" disperse air pollution that annoyed local communities. They never dreamed that the chemicals they pumped into the atmosphere would be carried hundreds, even thousands, of miles and would change the nature of rain and snow over half of the continent. One obvious solution to the problem is to reduce the amount of pollutants entering the atmosphere. Yet, we're in the midst of an energy crisis and the national mood favors relaxing clean air standards and burning more coal — a very dirty fuel when it comes to sulfur emissions. Ironically, at the same time problems caused by acid rain are increasing, we are in the act of modifying laws and regulations to permit more air pollution.

"Some of the solutions to the problems of acid precipitation will be forced on us in the future as energy grows more expensive," said Cowling. "We could burn more wood for heat instead of high sulfur coal. We could also quit turning on our air conditioners every time it gets hot and use more solar energy. We're going to have to make some difficult choices eventually."



This map shows how acid rain spreads into the eastern United States with prevailing winds. Petrochemical complexes in Texas, steel mills in Indiana, heavy industry in the Ohio River Valley, and giant smelting complexes in Ontario all contribute to the pollutants pumped into the atmosphere every year.

Over 170,000 students have successfully passed hunter safety training in

Hunter Safety Hits The Mark

By Rick Estes

Despite what some people think, hunting is one of the safest of all outdoor sports. It's safer than swimming, jogging, and bicycling, for example, and is becoming less dangerous all the time.

During the seven years preceding 1971, 81 people died as a result of hunting accidents in North Carolina. During the next seven years, 67 hunting fatalities were recorded. If you compare the two seven-year periods, the number of all hunting accidents dropped by 38%.

Although even a single hunting accident is too many, this reduction in fatalities is encouraging. What has happened that could contribute to this decline? One thing is certain; 1971 marked the beginning of the Wildlife Resources Commission's hunter safety program.

What exactly is hunter safety education and how does it work?

Essentially, the Commission employs three hunter safety officers who train adult, volunteer instructors to teach an eight-hour hunter safety program to public school classes and other interested groups.

Under this program, some 2,500 instructors had certified over 170,000 students as of June 30, 1978. Only two of those 170,000 had been involved in a serious firearms-related accident, and none had caused a fatality. That, you must agree, is a fairly impressive record.

The program itself is a combination of gun safety training, wildlife education, hunter ethics and first aid. It is not designed to encourage hunting or improve hunting skills, as such, but to make participants safer and more competent in dealing with firearms, regardless of whether they may ever hunt.

In today's society, practically everyone comes into contact with guns at some time. Many people who do not hunt own one or more guns for protection, target shooting, or simply because they feel they should have a firearm "just in case." Gun ownership is a tradition at least as old as this nation.

The hunter safety course familiarizes the participant with guns: different types of guns, the component parts of a gun, how they work, and how to use them safely. Understanding firearms — just like understanding any other mechanical device — helps overcome fears and leads to confident, safe use.

Hunter safety training occurs on two levels. First, instructors must be trained, then they must teach and certify students. Instructor training can only be offered by the Wildlife Resources Commission's three hunter safety officers. The training varies somewhat depending upon the background of each prospective instructor. For persons trained in

lorth Carolina, and the accident rate has dipped dramatically.

Ken Taylor

teaching techniques, such as the junior high school health and physical education teachers who make up the majority of hunter safety instructors in North Carolina, it's a matter of familiarizing them with the materials to be taught, making audio-visual aids available, and explaining the reporting procedures and objectives of the course.

A hunter safety officer can usually prepare a public school teacher to handle a hunter safety class in a two to three hour session. Many times a school system interested in offering hunter safety training will arrange a ten-hour credit course for its teachers. This can be handled through the hunter safety officer, but teachers can be certified in less time.

Other adults interested in becoming instructors are usually trained in several sessions totaling ten hours. Much of this additional time is devoted to teaching methods and suggestions. Also, nonprofessional instructors may need more time to become comfortable with the audio-visual aids that are a part of the course.

The key to North Carolina's successful hunter safety program has been the training of the instructors who actually teach the courses to interested groups and school classes. Over 2,500 instructors have certified more than 170,000 students in North Carolina. Here, Wildlife Commission Hunter Safety Officer Wilton Pate conducts a training class for instructors.

A split second of stupidity can cost you an eternity. Each of these photos shows a careless or dangerous act with a gun.

The occupation of an instructor is not as important in determining his success as his attitude. The best teachers are often those who take the hunter safety instructor training solely because they want to, and eventually they use their training to teach more classes. (Each instructor is required to teach at least one class in 18 months or lose his certificate.)

The hunter safety course for students consists of a manual, handouts, slides and 16mm movies. The entire course is contained in the manual, while the audio-visual aids supplement the written material.

Students, including adults who want to take the course, learn about various types of guns and ammunition and how they work, as well as how to use and care for firearms safely, and much more. The course requires at least eight hours of contact between student and instructor, but instructors often design their courses to last 20 or more hours. The student manual also covers vision and color related to gun safety, information about game animals, and basic first aid. The wide variety of materials in the manual is designed to allow considerable leeway in planning the course beyond the basic eight-hour requirement.

At the end of the course, both the instructor and the students must pass a test on the materials presented. In addition to the test, however, attitude and application of safety rules are considered.

Those who graduate receive a hunter safety card honored in all 50 states and Canada. That card is especially important to anyone planning to hunt in another state. Many states require hunter safety training to buy a license, so anyone planning a hunting trip to such a state should arrange to get certified at least six months to a year before the trip.

There is another good reason to get certified as a safe hunter. The legislature has directed the Wildlife Resources Commission to study the feasibility of implementing mandatory hunter safety training in North Carolina. Should that become a reality, and it is a good possibility, some system will be established to require everyone in a certain age class or other category to complete the program before buying a North Carolina hunting license.

There are several ways to start a hunter safety program or to find out what is already available in your community. Each Wildlife Enforcement Officer is a certified hunter safety instructor and usually knows several other individuals who can provide instruction toward certification. Also, he knows the hunter safety officer for the area and may be able to help set up a course to train other instructors.

If your school system does not presently offer the hunter safety course, you can ask the system administration to contact the Wildlife Resources Commission for information. Talk to your local wildlife enforcement officer, the hunter safety officer for the area, or call toll free 1-800-662-7137, for details.

Letters

Dear Sir:

I just thought I'd let you know how our family coped with the terrible gas shortage this past summer.

— We planted a garden, and instead of everyone disappearing for the evening, we all worked together for awhile.
— We sat on the porch and listened to the crickets and watched the fireflies.
— We didn't take a long vacation. We took day trips to natural areas close to home and hiked, fished and picnicked.
— We bought a canoe instead of a motorboat.
— We went for walks several nights a week.
— The whole family seemed to get to know each other.

As you can see, we suffered terribly. The gas shortage may be a blessing in disguise. We found some pretty neat places right under our noses.

Sharon Makem
Asheville

Dear Sir:

A little over a year ago, I mailed your office a write-up that was printed in the Red Springs newspaper about a white martin that was raised in my backyard. Here is what has happened since you heard from me. This year, I presume the same pair of martins raised another white martin. There were two blacks and one white young martin in the gourd. When the white martin was almost ready to start flying, it fell out of the gourd. My wife happened to see the bird on the ground. She ran out and got the young white martin and put it in a small cage we had. We called a veterinarian, and asked what to try and feed the bird. The vet suggested we try ground hamburger mixed with grit of some kind. We did just that. After a few days, the young bird began to eat real well. We also fed it water with a medicine dropper. I carried the bird out close to the gourds where it was raised, trying to get it to go back with the flock but did not have any luck. The bird lived about two months and was doing real well. Then all at once, it quit eating and in a few days it died. I guess we were not feeding it the right food. This is the third year that a white martin has been raised in my backyard.

Stewart Tolar
Red Springs

Dear Sir:

I think you have an excellent publication, and I look forward to reading it each month, even though the last time I went hunting or fishing, we were armed only with clubs and were viciously attacked by a tyrannosaurus. I became a vegetarian.

One of the all-time great lines came out of your magazine ("Country Store Gourmet," December, 1978). Kid asked his dad why the pork'n beans had only one piece of pork in it. The dad brilliantly explained that if it had more, they'd have to call it porks 'n beans. A classic.

Bob Inskeep
WRAL 101 FM
Raleigh

Dear Sir:

My husband and I read *Wildlife In North Carolina* from cover to cover — no matter what the subject (well, to tell the truth, I shy away from the snake things). The photography alone is so wonderful it would make a subscription worthwhile. I don't see how the staff finds time to write and write so interestingly on so many subjects. The layout of the magazine is so superior to the way it used to be.

I think every North Carolinian should have *Wildlife* coming to their home every month.

Congratulations, again, and best wishes,

Mrs. Charles S. Byers
Raleigh

Dear Sir:

With pleasure and a touch of nostalgia I have read "The Crisis In Adventure" which was in Natural Heritage in the September issue of *Wildlife*.

As one who is an octogenarian by several years, I find that one of the real pleasures of "added years" is the memory of those days when one could seek and easily find beauty spots of nature untouched by human visitation or the tourist hordes — free of the sounds of modern civilization.

May your publication help preserve the few remaining bits of "natural nature" for the generations ahead.

Dudley Smith
Tryon

Dear Sir:

I have just been reading the *Wildlife In North Carolina* for August, and I would like to compliment those who had a part in it. Although, you have published many good magazines before, this one is the best of all. All the stories are very interesting, starting with "Our Natural Heritage" by Jim Dean. I wish to congratulate Jim on this feature which he writes every month. It makes one sad seeing old tobacco barns, covered bridges, etc., disappearing from view which were once a part of our life when we were young. Also, I would like to compliment your fine photographer, Ken Taylor, for his work on the Eno River and his good photos on the front and back covers, especially the photo of the six-spotted fishing spider. I have seen this spider many times on rivers and lakes, but didn't know the name of it.

Mark Taylor did an excellent job on the story "To Save A River." It is very interesting. Curtis Wooten deserves compliments on the very good story "The Smallmouth Bass Is Back." I love fish stories and this is one of the best.

Rick Estes' article "Bear In The Air" is also very interesting. Mark Taylor's "Back of the Book" on the world's largest windmill in Boone deserves high praise.

I look forward to Duane Raver's piece about "Nature's Ways." He always has something very interesting each month. I hope all of you can stay together and keep on doing the good work it takes to make a very good magazine better. I have received your magazine many years and I always look forward to the first of each month when it comes.

In closing, I wish to say again, thanks for a job well done by each of you.

James Campbell
High Point

Dear Sir:

May I suggest that it would be logical for a publication issued by the Resources Commission to include a small section at least listing the opening date of any hunting season which commences during the ensuing month.

When I received the issue for September, the first thing I looked for was to verify the opening of the dove season which you know was not even mentioned.

I would think that the game laws would almost automatically be included as an integral section of your publication.

Harry F. White
Wilmington

Dear Mr. White,

We agree that this is an excellent idea, but unfortunately, the dove hunting regulations are adopted in late August, too late for inclusion in the September issue. As is the case with most magazines, we work several months ahead, and our deadlines arrive before the information is available. We always issue news releases concerning the hunting regulations as soon as they are adopted, and all license agents across the State have free copies of the regulations digest prior to the opening of the fall seasons.

Dear Sir:

Recently I received, just like many times before, your fantastic magazine, *Wildlife in North Carolina*.

Time after time it was a great pleasure for me to read about your beautiful state. It was during my period as Districts Governor of Lions Clubs International (Netherlands) that I received your magazines and now my year as Governor has ended. Please send the necessary forms to continue my subscription. I look forward to receiving your beautiful magazine again.

A. B. Claasen
Leende, Holland

Shorebirds Being Dyed, Banded To Follow Their Migrations

Bird watchers in eastern North Carolina should keep their eyes peeled for dyed birds this fall and winter.

The Canadian Wildlife Service has been conducting a large scale shorebird banding and dyeing program since 1974 in an effort to learn more about these bird's habits, population status and migration. The birds are trapped, banded and dyed at James Bay in Ontario which forms the southern tip of Hudson Bay. Over 38,500 shorebirds have been banded and dyed since 1974, with over 1,700 sightings from the Maritime Provinces of Canada to South America.

The bodies and wings of the birds have been dyed and their legs banded. Reports should include the species, sex, location, date, color of dye, portion of bird dyed and observations of other shorebirds present. There have also been colored leg bands placed on the birds. Observers should note the color and number of the bands, which leg they're on, and whether they're above or below the "knee."

Dr. R.I.G. Morrison of Ottawa is doing the work, and he has found that many shorebirds migrate to South America for the winter. Sandpipers generally winter in Brazil and red knots (also called robin snipe) go to Tierra del Fuego at the tip of South America. Many shorebirds nest in the Canadian arctic.

The Outer Banks of North Carolina is one of the best areas to observe shorebirds and waterfowl on the Atlantic coast. The Outer Banks lie about 100 miles east of the general coastline stretching from Maine to Florida, so migrating birds tend to pass over the barrier beaches instead of veering out to sea. At least 356 different species of birds have been recorded at the Cape Hatteras National Seashore.

Jack Dermid

Shorebirds are being banded and marked in an attempt to learn more about their movements. The Canadian Wildlife Service is banding shorebirds at James Bay with brightly colored dyes and leg bands. Bird watchers should watch for these birds since they often pass over the Outer Banks in their extensive migrations.

Anyone sighting dyed shorebirds should write to Dr. R.I.G. Morrison, Canadian Wildlife Service, 1725 Woodward Drive, Ottawa, Canada IIG 3Z7. All reports will be acknowledged and appreciated. For more information on bird watching on the Outer Banks, contact the Cape Hatteras National Seashore, Box 675, Manteo, N.C. 27954.

Red Sore Disease Epidemics Linked To Organic Pollution

Scientists at Wake Forest University believe that the outbreak of red sore disease which occurred last summer and fall on Albemarle Sound and the Chowan River was caused by pollution. Red sore disease produces red, ulcerous sores on fish's bodies. In its later stages, it attacks the internal organs and causes severe hemorrhaging. Many fish contracting the disease die, and the disease occasionally causes massive fish kills when conditions are right.

Dr. Gerald Esch, a member of the team, believes the disease is caused by *Aeromonas*, a bacteria that flourishes in polluted water. Esch feels that environmental stress makes fish more susceptible to the bacterial infection. Declining water quality on the Chowan River and in Albemarle Sound is providing the stress that is contributing to the outbreak.

Esch's research also shows that the stress caused by poor water quality lowers the white blood cell count in fish, reducing their ability to fight infection. These same factors also increase the density of *Aeromonas* in the water.

"I believe that the organic pollution that has caused the algal bloom in the river and sound for the past few years is also causing the outbreak of red sore disease," said Esch. "High phosphate levels increase *Aeromonas* counts, and we often find high fecal coliform bacteria counts in areas where *Aeromonas* levels are high. Fecal coliform are found in human, animal and bird wastes and enter the water from municipal sewage and agricultural operations. Phosphate enters the sound from industrial pollution and agricultural runoff."

Altough red sore disease has always been present, Esch feels man's activities have resulted in larger epidemics and possibly more virulent strains of the disease.

"We've always had red sore disease in our waters," said Esch. "But when we pollute the waters, we create conditions where massive buildups of the pathogens can occur. Then a large scale epidemic breaks out, and the fish that survive, develop a short-lived resistance. However, the disease pathogens respond to antibody attacks by altering their character, creating new strains of the disease. This can sometimes occur almost overnight. Then the new strain causes another epidemic, and more virulent strains continue to develop."

Esch points out that this is not only true of red sore disease, but of other diseases as well. Malaria, venereal disease and sleeping sickness all offer examples of diseases that have grown more virulent over the years in spite of man's attempts to eradicate them.

There are several major problem areas where pollution is heaviest, according to Esch. They include the area below the Weyerhaeuser plant in Plymouth, the Farmer's Chemical plant on the Chowan River and in the Elizabeth City area. His research shows that *Aeromonas* levels are higher in these areas than any others.

"The levels of *Aeromonas* and coliform in Welsch Creek below the Weyerhaeuser plant discharge are the highest we've found in the sound," said Esch. "This is the only place where we've seen the water become anoxic, which means pollution levels are so high that the water is totally without oxygen."

Esch adds that no one city or industry can be blamed for the problem because pollutants are being dumped into all parts of the river and sound.

"We will continue to have red sore disease epidemics in Albemarle Sound until we clean up the water," said Esch. "Everyone is responsible for the problem. We're creating the conditions that allow massive red sore epidemics to break out. The key to controlling red sore disease is to restore high water quality to Albemarle Sound and the Chowan River."

Federal Nongame Bill Will Fund State Programs

The U.S. House of Representatives recently passed the Forsythe Nongame Bill, which will distribute $19 million in federal funds from 1980 to 1982 to state wildlife and natural resource agencies for managing nongame fish and wildlife species. Congressman Edwin Forsythe of New Jersey, author of the bill, plans to develop additional legislation that will fund nongame wildlife conservation through an excise tax on bird feed and feeders, bird baths and houses, and other birding paraphernalia.

The N.C. Wildlife Resources Commission currently has no programs aimed specifically at nongame species except for the endangered species program. However, much of the Commission's wildlife management does benefit nongame as well as game species.

"Our maintenance and development of food plots on game lands and on private lands benefit many songbirds and nongame animals," said George Smith, assistant chief of the Commission's Game Division. "Much of our habitat manipulation works the same way. When we preserve wildlife habitat by including it in our game lands program, we help all wildlife species."

According to Smith, the funds from the new nongame program could be used in many different ways.

"One of the most valuable ways to use nongame funds would be to provide more recreational opportunities for the nonconsumptive use of wildlife," said Smith. "For example, trails and blinds could be built on game lands and other areas allowing the public an opportunity to observe and photograph different wildlife species. Habitat work in these areas could also be aimed at attracting and favoring nongame species. This has been done on many federal waterfowl refuges with great success, where many bird watchers enjoy watching waterfowl, shorebirds and other game and nongame wildlife species."

Nonconsumptive use of wildlife, including such activities as bird watching, wildlife photography and bird feeding, ranks as one of our most popular national pastimes. A survey done by the U.S. Fish and Wildlife Service in 1975 showed that over 49 million Americans were actively involved in wildlife observation on a regular basis. Some 15 million Americans listed wildlife photography as one of their hobbies. A North Carolina survey shows that the State has over two million participants engaged in wildlife observation, wildlife photography, clamming, crabbing and sea shell collecting. Many sportsmen are included in these statistics.

Leonard Lee Rue

The U. S. House of Representatives recently passed the Forsythe Nongame Bill, which will distribute federal funds to state wildlife and natural resources agencies for nongame wildlife work. Species like the flying squirrel will benefit from the program.

Volunteer Program Directed At Cleaning Up Toxic Wastes

Six national organizations have started a nationwide citizens program called "Waste Alert" to ensure that hazardous wastes are properly disposed of and monitored for as long as necessary to ensure their security. The six organizations are the National Wildlife Federation, American Public Health Association, Environmental Action Foundation, League of Women Voters Education Fund, Izaak Walton League of America and the Technical Information Project. The program is being funded through a $350,000 grant from the Environmental Protection Agency.

"We are holding regional workshops throughout the United States to introduce this program to interested volunteers," said Sandy Jerabek, waste program director for the National Wildlife Federation. "We hope to organize statewide task forces on hazardous wastes composed of interested citizens and representative of different environmental organizations."

The role the task forces will play will vary according to the needs of the individual states, according to Jerabek. The groups could work in identifying existing hazardous waste sites within the State, and see that governmental agencies clean up these sites and ensure they do not represent a danger to public health. The task force could also work with agencies to develop a comprehensive waste management plan. This could include educating the public to the need for waste management facilities, and could include proposed sites for facilities where toxic wastes could be safely stored or recycled. Task forces would also see that government agencies enforce regulations concerning toxic waste disposal at existing sites.

"The amount of hazardous wastes produced in this nation is staggering," said Jerabek. "We're going to need comprehensive management plans and applied technology to cope with this problem. Citizens can provide the pressure needed to get these plans into action and make sure that existing sites are cleaned up and properly managed."

The Environmental Protection Agency estimates that 30 to 40 million tons of hazardous wastes are produced annually and 90 percent of these wastes may currently be disposed of improperly. Another EPA study has shown that there may be 30,000 to 50,000 abandoned chemical dumps scattered across the nation and that up to 2,000 of these sites could be hazardous.

The EPA has extimated that the cost of cleaning up these known hazardous sites runs from $26 to $44 billion. The agency has recommended that Congress create a "superfund" to pay the clean-up costs. EPA also says that, whenever possible, they will try to recover money from the firms and individuals that disposed of the wastes improperly.

For more information on "Waste Alert" and to learn how you can participate in the program, write to the National Wildlife Federation Solid Waste Project, 1412 16th Street, N.W., Washington, D.C. 20036 or call 202-797-6883.

July Enforcement Report

For the month of July, 1979, the N.C. Wildlife Resources Commission checked a total of 27,434 hunters and fishermen and 13, 677 boaters.

Of the hunters and fishermen, 1,371 were prosecuted and 1,230 convictions were obtained. The total fines collected were $7,233 and the total costs collected were $29,071.

Of the boaters, 893 prosecutions were made and 822 convictions were obtained. Total fines collected were $1,356 and total costs collected were $19,604.

Other prosecutions totaled 58 and convictions totaled 50. Total fines collected were $501 and total costs were $1,134.

All fines and any arrests or witness fees are paid into the school funds of the counties in which the violation occurred, and no fines or costs are paid to the N.C. Wildlife Resources Commission or its personnel.

Muskies Offer Trophy Angling In Several Mountain Rivers

Northern muskellunge, the large, hard-fighting game fish that were once found in several of the State's Mountain rivers, are making a comeback thanks to a stocking program conducted by the N.C. Wildlife Resources Commission.

At the turn of the century, the Ohio strain of the northern muskie was fairly common in several major Tar Heel rivers that flow to the Mississippi. Reports of catches of 30-to 40-pound fish were not uncommon. But with economic development of the Mountains came pollution and siltation, and the ability of the rivers to support muskie declined drastically. By the early 1950s, these magnificent fish were just a memory.

The passage and implementation of State and federal water quality control acts in the 1960s improved the water quality of many rivers. By 1969, Commission fisheries biologists felt that there were rivers in the mountains which could support muskie.

Annual stockings of the fish have been made in the French Broad, Little Tennessee, Nolichucky and New rivers and Lake Adger since 1970. Lake Adger is being stocked to develop a local source of muskie eggs. Most of the muskie stocked so far have come from eggs shipped in from Ohio and Michigan and reared at the Commission's Marion and Table Rock fish hatcheries.

"The stocking program is producing positive results," said Jay Davies, a Commission fisheries biologist from Sylva. "We're getting regular reports of 12-to 15-pound fish being caught from the French Broad and Little Tennessee rivers, and I'm sure the Nolichucky and New rivers are also producing good catches. These fish are still relatively small compared to their potential size. We expect to see some 30-and 40-pound muskie come from these waters in a few years, and they could even run bigger than that."

The muskie has a reputation for being a ferocious fighter, but difficult to catch. Muskie fishermen throughout the North and Midwest are a breed apart, and they figure that it takes an average of 40 hours fishing time to produce a single muskie strike.

A trophy fishery for tiger muskie, a cross between the muskie and northern pike, is also being established in several of North Carolina's Mountain lakes. Lake Fontana, Hiwassee, Rhodhiss and W. Kerr Scott Reservoir have been stocked with tiger muskies since 1974. These fish run smaller than the true muskie, but are somewhat easier to catch. Both fish have voracious appetites and prefer to feed on soft-ray fishes such as carp, chub and suckers.

Muskie fishing requires stouter tackle than is used by most Mountain fishermen. Serious muskie fisherman usually use a heavy rod equipped with a heavy bait-casting reel and a minimum of 20-pound test line. A steel leader is also recommended. The fish will take large spoons and plugs or live chubs and suckers from six to seven inches long. Long, deep pools with weed beds around the edge are favored haunts of the northern muskie.

— Curtis Wooten
Mountain Information & Education Representative

Curtis Wooten

Muskies now offer fine angling in several Mountain rivers. This pair of 20-pound muskies was taken from the New River near the North Carolina-Virginia border last winter. The fish will hit all winter long and prefer flashy spoons or live minnows. Fishing for muskie is a time-consuming experience, but the payoff is unforgettable.

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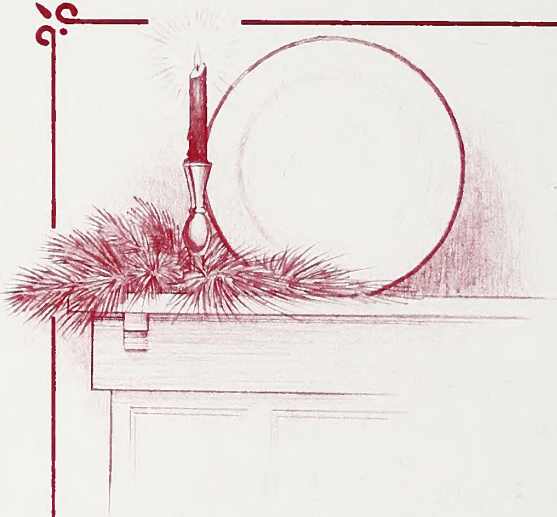


Season's Greetings

From

WILDLIFE
IN NORTH CAROLINA

N/D 79

Nature's Ways

The Miracle of Flight

written and illustrated by Duane Raver

So many of the marvels of nature that we seem to take for granted are actually masterpieces of design and construction. Every day we see some sort of flight in the world of nature — birds, insects, perhaps even a mammal — and we scarcely give it a second thought.

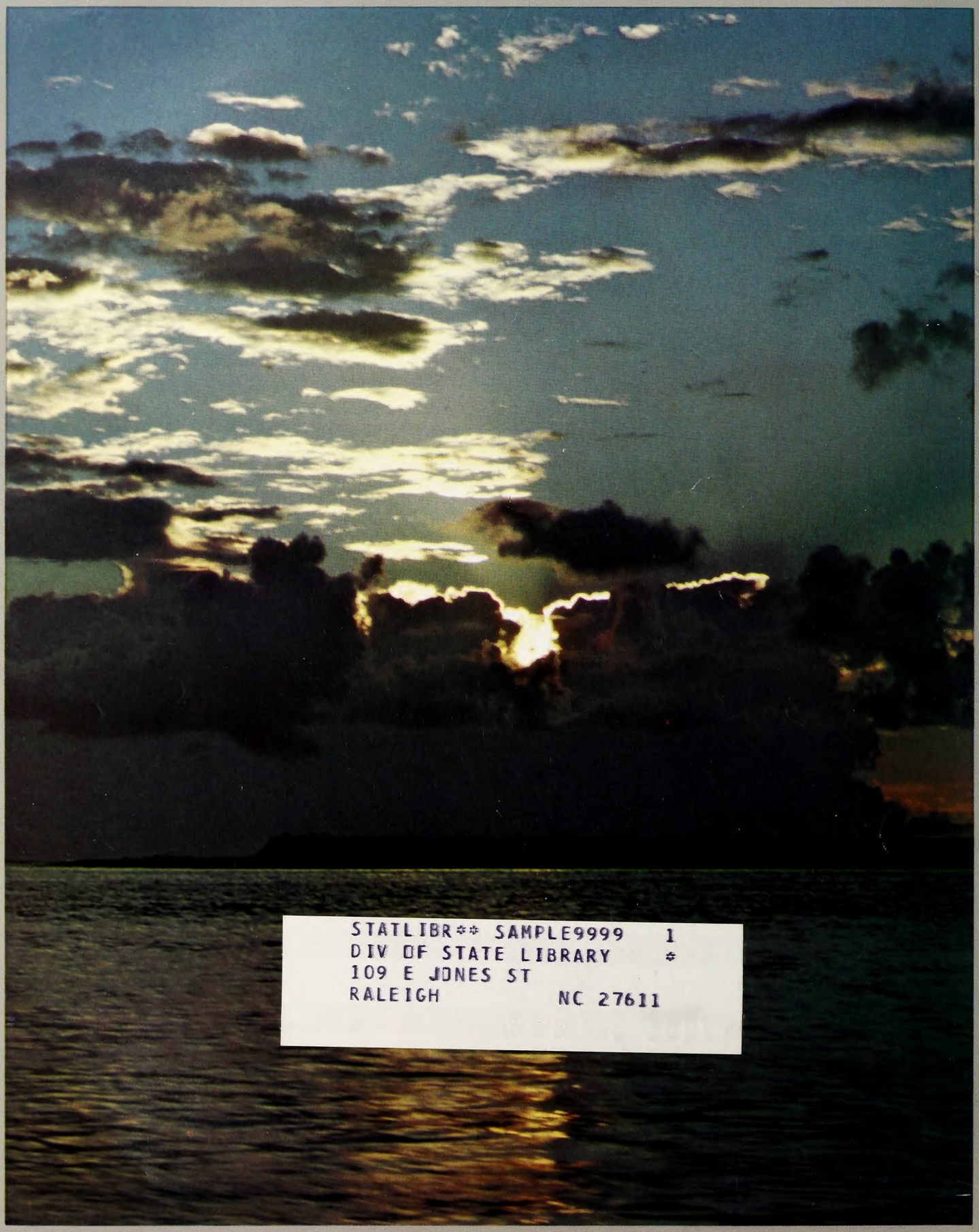
Flight has intrigued man for centuries, to the point that he has longed to lift himself from the ground and fly like the birds. Although the age-old dream of flight has been achieved by complicated mechanical means, man isn't likely to ever "fly like the birds."

Many structures and systems are coordinated for bird flight, but the feather certainly must be near the top of the list as being responsible for the fact that birds can fly. It is a unique combination of strength and lightness — even more versatile and effective than the thin, tough skin that supports the bat in its flight. And certainly the feather and wing conformation makes the rigid construction of an aircraft wing rather cumbersome by comparison.

A few minute's examination of a bird's feather is a trip into nature's world of masterful design and functional construction. "Featherlight" has long been an expression of virtual weightlessness. Yet the shaft, the parallel barbs and their interlocking filaments form a strong, effective surface for the rigors and split-second maneuvering of flight. The zipper-like construction makes feathers soft yet repairable with a touch.

Body feathers provide the highest quality insulation and also create a smooth, streamlined surface that helps the bird "slide" through the air. Every system of the bird seems geared to flight. In a few cases, such as the ostrich and penguins and the long-gone dodo, flight is extremely limited or simply impossible. Yet with the vast majority of birds, most of the bones are hollow but made strong and rigid by internal "struts." The entire skeleton is a masterpiece of strength and lightness and minimal in number (several bones found in mammals are missing in birds). Thin yet with extra surfaces (for muscle attachment and fused at stress points), bird bones have the central purpose of flight.

Not all birds are "tireless" fliers. The bobwhite quail needs explosive bursts of speed for quick escape, but can't sustain these flights for more than a few hundred yards. Ducks, geese and many other migratory birds have systems designed for hours of continuous flight. Lungs, circulatory systems, as well as the muscles, all work together to drive the birds thousands of miles, often in near freezing temperatures and against adverse weather. Birds are truly "built for a world of air."



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Our Natural Heritage

By Jim Dean

Our Booming Whitetail Population

Leonard Lee Rue III

Four deer crossed the road ahead of us and stood silently in the edge of the woods watching as we drove slowly past. We were in the suburbs of Raleigh, and the passengers in my car were amazed at the sight of these handsome creatures.

"I've never seen but one or two deer in my life, and here are four of them in the city limits of the State Capital," said one man. "I thought deer were practically extinct."

"So did I," agreed his companion. "That's pretty much common knowledge, isn't it?"

I tried to explain that what seemed to be common knowledge was actually a common misconception, but I'm not sure I was able to convince anyone.

I suspect that misconceptions about deer and other wildlife populations in North Carolina are fairly widespread, and it's probably the result of the concern and publicity given to those particular wildlife species which actually are threatened and endangered. People who read about such endangered species as red-cockaded woodpeckers, snail darters, Eastern cougars and the like may have gotten the idea that time is running out for deer, doves, squirrels and just about everything else. The truth is that the populations of these and most other wildlife species are in good shape, and some are better than any time in history.

Take the whitetail, for example. There are more deer in North Carolina today than at any time in recorded history. Based on kill figures, tagging studies, crop depredation and other means of measurement, wildlife biologists estimate that there may be as many as half a million whitetails here today.

In 1950, the State's deer population was relatively small, and largely confined to the coastal counties. In the mountains, there were deer only on the old wildlife management areas. With the exception of a few management areas and military bases, there were very few deer anywhere in the Piedmont. By 1979, there were deer in virtually every county in the State. Populations are still fairly light in some portions of the Piedmont, but other mid-state sections which had no deer at all in 1950 now have moderate to heavy populations. The deer population in some coastal counties has grown to the point that the herds have outstripped the land's ability to support them. Crop depredation is a problem.

In the mountains, deer populations are still light in many areas; but where deer were once nonexistent, herds are now growing and spreading. This includes not only the expanded game lands, but also many private lands. Biologists believe that this trend will continue, especially in the Mountains and Piedmont.

In 1584, explorer Thomas Heriot wrote about the deer and other wildlife he saw along our coast; but deer populations did not reach their peaks in the kinds of mature forests which covered the State in the sixteenth century.

As North Carolina was settled, deer were hunted year-round for food and hides. Everybody hunted, and wildlife populations, including deer, began to decline. There was no protection for wildlife (nor any game laws), no wildlife management, no habitat improvement, no stocking and no research. By the late 1800s, some wildlife populations were in bad shape.

Ironically, the rise of sport hunting since 1900 has been largely responsible for the restoration of many species.

"The return of deer to abundance is almost entirely the result of two things," says Grady Barnes, Assistant Chief of Operations for the Wildlife Commission's Division of Game. "The first truly effective game laws were passed in the 1940s, and law enforcement began to have an impact. Second, the more recent stocking of deer in carefully selected parts of the State has greatly speeded up the natural spread of the populations."

These programs have all been initiated and paid for by sport hunters; and over the past few decades, many nongame and endangered species have benefited from the same wildlife law enforcement, research and habitat improvement. There are, of course, still threats to the future prosperity of wildlife. Advancing civilization is destroying habitats, and it is increasingly apparent that many dangerous toxic substances are loose in the environment.

But the accomplishments of the past are beyond dispute, and the restoration of deer in North Carolina is one of them.

WILDLIFE IN NORTH CAROLINA

"Wildlife in North Carolina" is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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Front Cover *"Collector's Choice" By Joe Seme*
Early waterfowl hunters never realized that the decoys they carved might someday be worth large sums of money to collectors. The old masters at this craft had distinctive styles, and men like Ira Hudson of Chincoteague, Virginia and Charles Perdew of Henry, Illinois were among the best. Hudson's black duck (lower left), and Perdew's mallard drake (lower right) are among the famous styles in this Seme watercolor.

Back Cover *Photograph by Steve Maslowski*

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The Waterfowler's Art

Watercolor Paintings by Joe Seme

History, craftmanship, nostalgia and art are all combined in Joe Seme's realistic watercolor paintings of duck decoys.

"Senior Citizens"

This was the first of my decoy paintings. As a teenager I hunted the marshes of Barnegat Bay, and in those days the bay was a waterfowler's paradise. Today, "progress" in the form of nuclear power plants, marinas, shopping centers and waterfront condominiums has taken its toll on the bay.

I left New Jersey and Barnegat Bay in the early sixties. After college and the Marines, I moved to the Blue Ridge Mountains. Visits to the north were (and are) infrequent, but it was on one of these visits that I discovered the battered old bluebill decoy (next to the canvasback on the left) and the whole idea was triggered. Turning that bird over in my hands, I began to see past the dirt, cracks and flaking paint to the crusty baymen and gunners who made and used these old birds, and I decided to do a painting to pay tribute to these men and this small piece of history. I had no idea that I would become so deeply and lovingly involved.

"Upper Bay Cans" or "Legends"

The "Upper Bay," also called the Susquehanna Flats because of its nearly 25,000 acres of extremely shallow water, is where the Susquehanna River empties into Chesapeake Bay. This shallow water nurtures wild celery and other succulent aquatic plants which, at the turn of the century, attracted thousands and thousands of migrating ducks. More decoys were made and used on the flats than in any other region, and it has been estimated that more than 40,000 decoys were used here around the turn of the century. Canvasback ducks were the most abundant, so the majority of decoys were cans.

I know some decoy collectors who won't even look at a decoy unless it's "Upper Bay." I have more of these birds than any others and they really are special for several reasons. The men who carved them are legends. Names like John "Daddy" Holly, Sam Barnes and William Haverin are spoken with reverence by collectors. Each man had his own idea of what the bird should look like, and each man's style seldom changed, though they were all essentially neighbors.

At first glance, these birds all look alike but if you look closely, they're not. A certain type of nostril carving says "Henry Lockard;" a flat breast could only be a "Sam Barnes;" a flatter, wider body indicates that it's a "John Graham."

"Tollers"

I have heard various terms for these wooden birds; the most common, of course, is "decoy." I have also heard them referred to as "blocks," "stools," "stool ducks" and "tollers."

This painting is a grouping of some favorite regional "tollers" from my collection. The oldsquaw (lower left) is by an unknown, but talented New England maker; the merganser is from Long Island; the pintail is from the decoy-rich Illinois River area; the cans are from the Upper Chesapeake and the black duck and scaup are Ira Hudson's, from Chincoteague.

I collect wooden ammo boxes and use them as shelves in the studio so this is pretty much the way one wall of my studio looks. In this painting, I had some fun and "carved" my signature in the lower right corner.

"Man From Chincoteague"

This recent painting is a tribute to Ira Hudson, a most prolific and well-known decoy maker from Chincoteague, Virginia. Hudson made his entire living building small boats and making decoys. Some experts estimate that Ira made over 20,000 decoys before he died in 1949. Ira made several grades of decoys, depending on the season and the wood available, but the poverty of the area dictated a predominance of sturdy, durable decoys. That is why so many have survived to become part of collections.

Until Hudson died, his top price was $4 per dozen birds. Today, one Hudson may bring several thousand dollars. Hudson decoys are usually fat and contented-looking, and are a pleasure to have in a collection. I wanted to be sure and capture that special "Hudson" look in this painting, and I'd like to think that old Ira would be pleased.

When budding artist Joe Seme discovered a battered old decoy some years back, it triggered fond memories of duck hunts on Barnegat Bay as a youngster. As an artist, he saw not only craftsmanship and history in that old decoy, but also a subject for his fine, realistic watercolors.

Since that time, Seme has used decoys in many of his paintings, including those shown here and on this month's cover. In recent years, interest in waterfowl decoys has soared, and handmade decoys have greatly increased in value, especially those which can be linked to a particular carver. In most of Seme's paintings, there is a conscious effort to record the styles and types of decoys which were carved by various turn of the century waterfowlers.

To some extent, Seme's career as an artist began in much the same accidental fashion as his interest in using decoys as a subject. Seme, who lives with his wife, Chris, on a mountaintop near Linville in western North Carolina, was born in Newark, New Jersey in 1946, but he had little interest in art as a child.

"I wanted to be a writer, and until I graduated from Florida State University, my most ambitious art project was slapping paint on chain link fences while working summer jobs," says

Seme. "My involvement with watercolor came about while I was running a nightclub to try to build a financial cushion so that I could do some serious writing. The pace was hectic, and I needed a diversion. I bought an inexpensive tin box of watercolors and three brushes, and I've been painting ever since."

Somehow, it all seems illogical for a fellow who admits he has never had an art lesson. His background includes such unlikely training as professional snake hunter, free-lance writer for men's magazines, ski shop manager, Marine and nightclub proprietor. Yet, Seme has achieved not only personal success, but widespread acclaim in North Carolina and throughout the nation.

Seme was the featured watercolorist in the September 1978 issue of *American Artist*, and his paintings are part of several prestigious corporate collections, including the Integon Corporation, R. J. Reynolds in Winston-Salem, North Carolina National Bank and others. His work has been exhibited at the N. C. Museum of Art, Southeastern Center for Contemporary Art, the Mint Museum in Charlotte, and has been published in several magazines, including *Ducks Unlimited*.

Gear For Deer

What do you really need for your first deer hunt? Even experienced hunters may find these tips helpful.

By Jim Dean

There are approximately 200,000 deer hunters in North Carolina, which means that there may be at least that many different opinions on any given topic involving whitetails. This situation is especially frustrating to a beginner trying to pick out basic equipment for his first hunt.

"I've asked a bunch of deer hunters to tell me what they recommend

in the way of a rifle or shotgun, as well as any other gear I might need, and everybody seems to have a different answer," one friend told me.

"I know that there are lots of good choices a person can make, but I just want some basic information so that I won't make a serious mistake when I buy my first outfit," he added.

That's a common problem for beginners; and with North Carolina's deer population at its highest in history, more and more sportmen are facing it. Indeed, deer hunting has grown so rapidly in recent years that it may now be this State's most popular kind of hunting.

To help slice through some of the confusion surrounding equipment, I asked four of the most successful deer hunters I know to offer some basic tips. Here are some bits of general information which they offered.

Deer Rifles

A rifle is not recommended unless you are planning to still hunt without dogs (from a tree stand or other type of stand), and those considering a rifle are urged to check the laws in the areas they hope to hunt since rifles are illegal in some places.

Don't buy a rifle of less than .243 caliber. The .270, .30-06 and .308 are all recommended and one hunter indicated that he personally preferred the more powerful .300 Winchester magnum. Generally, however, all agreed that there was a greater tendency to flinch with the high powered loads, and pointed out that "placement of shot was far more important than power." Although the old standard .30-30 has probably killed more deer than any other cartridge, it was not highly recommended because there are better choices among more modern cartridges. One hunter candidly remarked that he recommended looking for the best deal among the above calibers when buying the gun rather than concentrating on any particular caliber, style or brand.

Of the four most common actions (bolt, semi-automatic, lever and pump), the bolt action was rated highest because it is conceded to be more durable, generally more accurate, and safer. A bolt action is less likely to jam, misfire or hangfire; however, semi-automatics will give you faster, better-aimed second and third shots. One hunter rated the semi-automatic last because he considered it more trouble-prone, but the others ranked it high. No one picked either the lever action or pump as a first choice.

Scopes

The hunters who used rifles all recommended scopes over iron or peep sights, and a good quality three to nine power variable was most frequently recommended because of its versatility when shooting at deer which may be anywhere from 20 yards to 200 or more yards away. A 4X scope was suggested for those who might not want to spend the extra money for a variable power scope. In low-light conditions, poor weather or heavy cover, scopes have caused problems in the past. Newer, high quality scopes have largely conquered these shortcomings.

Shotguns For Deer

For those deer hunters who are going to be hunting with dogs or in areas where rifles are banned, the shotgun is the alternative. All four experts recommended using buckshot in a 12-gauge shotgun, and some also specified a three-inch magnum chamber.

Whatever barrel length or choke you choose, it is recommended that you fire test patterns at 40 yards to see which buckshot load patterns most evenly. Some guns will throw a better pattern with No. 1 or O buckshot than with OO buckshot, while in others, the reverse is true. No one recommended using slugs unless the brush is thick. Buckshot will not penetrate heavy brush as well as a slug. If you use slugs, the special slug barrel will give you the best accuracy.

One hunter said he felt that the short barrels which are fairly popular will not pattern buckshot as well as a longer barrel, and he swears by a 30-inch, full choke barrel. Others believed that choke was not very important, and tests by experts tend to support this.

All hunters recommended a semi-automatic shotgun as their first choice, and most picked the pump a distant second because well aimed second shots cannot be made quite as quickly. Doubles are considered a poor choice, especially for shooting slugs since the barrels do not have the same point of impact.

Nearly every deer hunter considers a sharp knife an essential item of equipment, but there are other items of useful gear which are easily overlooked. Pruning shears help trim limbs which obstruct your view from a stand. Fluorescent surveyor's tape will help you mark a blood trail or a trail to and from your stand that's easy to find in the dark. Plastic

bags are handy for carrying the liver or other cuts after you've field dressed your kill. Insect repellent can be an intensely regretted oversight in the early season and the same might be said for toilet tissue, regardless of the time of the year. Of course, a buck rope is virtually essential to help you drag out your deer, yet some hunters forget to include one. Other useful items might include a nylon cord, extra shells or cartridges, snacks, a compass, flashlight, buck lure, rain gear, screw-in steps to reach your tree stand and some chewing tobacco. All these items can be carried in a small pack that will leave both arms free.

illustrations by David Williams

Deer Stands

Most of the hunters used various types of tree stands (especially for still hunting with a rifle). A tree stand improves the hunter's ability to see by elevating him above the forest floor. Also, deer are less apt to see you since they rarely look up, and human scent may not be as easily detected. Your choice of stand, however, will depend upon conditions. Semi-permanent stands with screw-in steps were highly recommended, especially for places where the stand could be left safely for several days or more. Ladder stands were also highly recommended for places where it would not be necessary to carry them long distances through thick cover. Climbing tree stands are very useful; but because they may not be as comfortable, quiet or safe as other types, they were recommended only when no better alternative was available.

Additional Gear

All four experts agreed that various other items of equipment could be considered essential. Those who still hunted felt that they needed more gear than those who took part in dog hunts or deer drives (indeed, one dog hunter suggested that the only things you might consider essential in addition to a gun were a stool to sit on, a skinning knife, appropriate clothes and a wad of chewing tobacco).

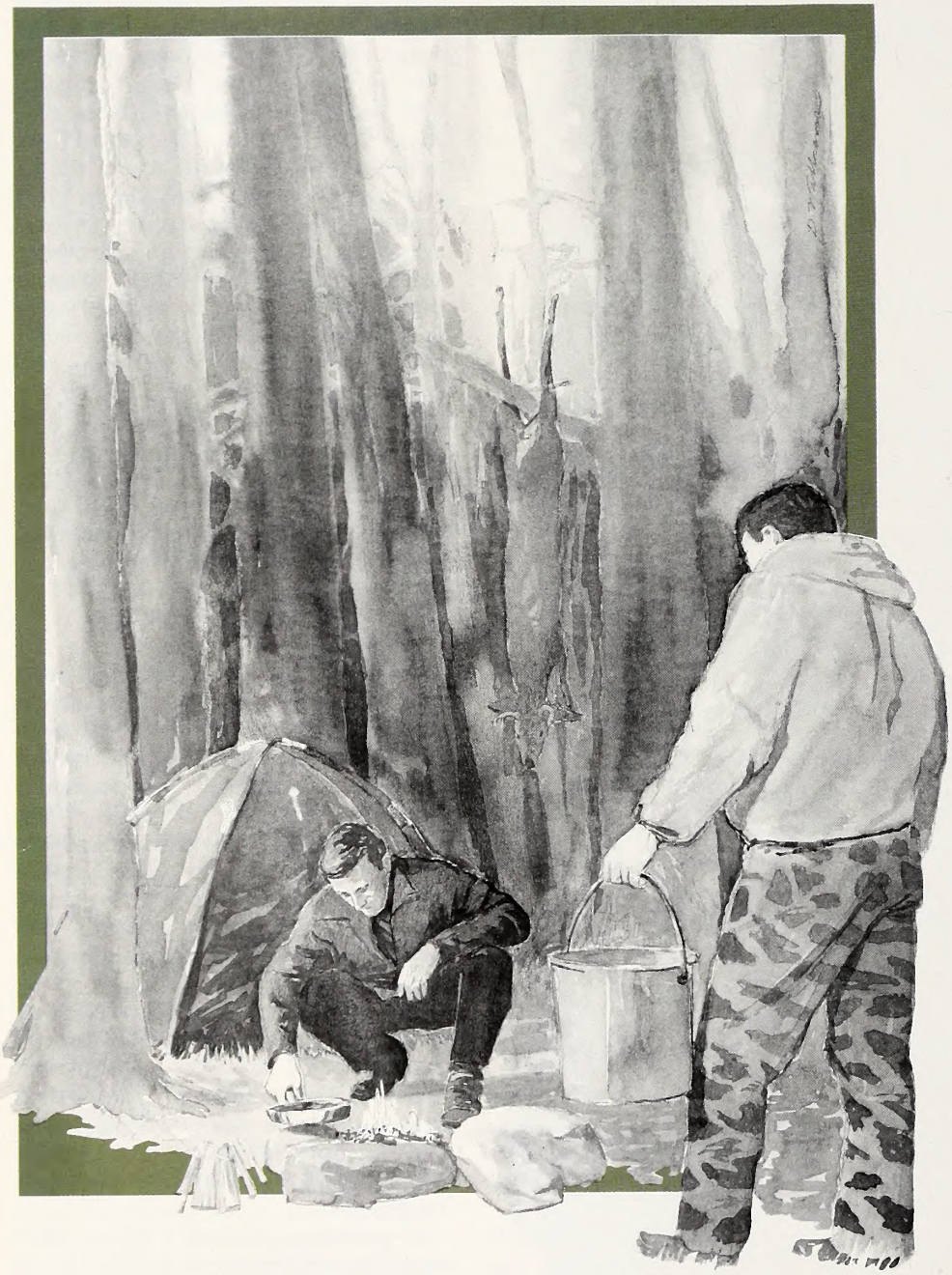
For those who plan to carry extra gear, a small knapsack is recommended. Still hunters usually leave most of this gear on the ground under the tree. The following is a rundown of some of the most useful gear, as well as a brief explanation of its purpose:

— pruning shears or limb trimmer to trim small obstructing branches to provide a clear shot.

— nylon shock line to raise and lower the gun or other gear (never climb to your tree stand carrying your gun, bow or other gear).

— buck rope to use as a climbing aid and safety rope while in the stand. This rope can also be used as an aid to help you drag your kill back to the vehicle. The dog hunters recommended carrying a leash to help catch dogs, and said that this could double for dragging out a kill.

— skinning knife to field dress



An outlandish array of expensive gear will not guarantee you a trophy buck because there is no substitute for a thorough knowledge of deer and their habits. Still, you can bet that proper equipment played a big part in the success of these hunters as they share fresh venison tenderloins around the evening campfire.

kill. While some hunters prefer a sheath knife, a folding knife with a three-inch blade is more than adequate, less cumbersome and safer (especially those which have a blade that locks open).

— rain suit or poncho in case of foul weather. A change of clothes was also suggested, although this was often left in the vehicle.

— insect repellent for use in early season. Some hunters felt that because of the odor, repellent should be used sparingly and only when necessary.

— surveyor's marking tape to mark the trail to the stand so that you can find it in the dark. Such tape is also useful to mark a blood trail when tracking a wounded deer.

— toilet paper was enthusiastically recommended by all four experts.

— a flashlight was suggested to help you get in or out of the woods when it is dark. Most hunters also said they carried a compass, but rarely needed it.

— drinking water or coffee and a light snack such as a candy bar or apple was recommended. All four experts strongly advised against smoking because the smell and hand movement may alarm deer. Chewing tobacco or snuff is suggested as a substitute. Gloves were recommended for warmth, and also to hide hand movement.

— blaze orange vest and cap were invariably worn, especially en route to and from the stand for safety reasons. Deer are color-blind.

— big game tags and licenses. Remember that deer must be tagged at the point of the kill *before* they are field dressed or moved.

Several other items were suggested which hunters might want to consider carrying, although many of these pieces of equipment can be left in the vehicle. They included such diverse items as snake leggings, a first-aid kit, topographic maps, a tow cable for the vehicle, hip boots, a spare rifle or shotgun, extra cartridges or shells, lock for deer stand, chapstick, binoculars, machete, bread ties (to help tag deer) and insulated coveralls.

Just in case you bag a deer, you should carry a large sheet of plastic so that you can keep from soiling the trunk of the car or the truck with the carcass. Also, smaller plastic bags can be used to carry various internal organs like the liver. One of our experts even carries a small meat saw ("I'm optimistic," he explained).

Not every experienced deer hunter will agree with all of these suggestions, but the information is basically sound; and if you follow it, you should wind up with suitable gear. With a little luck, you may also wind up with a suitable trophy and a freezer full of venison.

The Venison Gourmet

Venison is delicious, and whitetail deer are abundant in North Carolina. These recipes will show you why wild game cookery is an enduring Southern tradition.

Written by Curtis Wooten

The cooking of wild game is a North Carolina tradition that goes back to the days when settlers had no choice. You shot or trapped the main course or went without.

Venison or deer meat, has always been a favorite, and it is still one of the major ingredients in meals for many families. As odd as it may sound, venison is far more readily available now than ever before. In recent years, North Carolina's population of white-tailed deer has grown to record numbers. There are more deer in the State now than there were when this part of the world was first settled, or during any period since that time.

Venison is delicious when the meat has been properly cared for and the cook is capable. If you've never tried it, it's time you took part in an old tradition. That's especially true during the approaching holiday season. If you have no venison nor any hunting friends who might supply you with some, try the recipes on the following pages using beef. We, the staff of *Wildlife In North Carolina*, highly recommend the venison stroganoff dish shown. Moments after this photograph was taken, the stroganoff was devoured by our crew. We hope you enjoy yours.

Recipes for Venison

French Style Venison Stew

This is an adaptation of Beef Bourguignon

3 pounds venison stew meat, cubed
Drippings
Salt and pepper
1 large onion, chopped
1 cup beef stock or broth
4 tablespoons tomato paste
Parsley
Thyme
Bay leaf
1 cup Burgundy wine
1-1½ cups fresh mushrooms, sliced
1 can or jar small white onions

Brown meat in drippings, seasoning with salt and pepper, and remove from skillet. Add onion to skillet and cook until tender. Mix stock and tomato paste with onion and stir constantly as you bring the mixture to a boil. Return the meat to the skillet and add the Burgundy and spices. Cover and simmer over low heat until meat is tender. About 15 minutes before serving, add mushrooms and onions. Simmer until the flavors are blended. Serve over noodles or rice. Makes 6 to 8 servings.

Hunter's Venison

1 pound ground venison
¼ cup chopped onion
2 tablespoons bacon drippings
¼ teaspoon black pepper
¼ teaspoon chili powder
1½ teaspoon salt
2 cups cooked diced potatoes
1 10-ounce can string beans
1 12-ounce can whole kernel corn
1 cup tomato juice
2 medium-sized tomatoes, sliced
2 tablespoons grated cheddar cheese

Sauté onion in bacon drippings. Add meat and brown. Stir in pepper, chili powder and one teaspoon salt. Place in lightly greased two-quart casserole dish. Place potatoes, string beans and corn on top of meat. Add remaining salt. Pour tomato juice over vegetables. Sprinkle with cheese. Cover and bake at 350 degrees for one hour. Serves four hunters.

Barbecued Venison

2-3 pound venison round, leg or rump roast
1 12-ounce can of beer
3 cloves garlic
Salt and pepper
2 medium onions, sliced
3 bay leaves
2 cups barbecue sauce

Trim all excess fat from venison. In a large bowl, mix beer, garlic, salt, pepper, onions and bay leaves; add meat making sure it is covered with marinade. Marinate in the refrigerator for 12 to 24 hours, turning occasionally. Remove venison and onions from marinade and place in a crock pot. Pour 1½ cups of your favorite barbecue sauce over the meat. Cover and cook on low for 7 to 10 hours. This makes about 3 quarts or 6 servings.

Venison with Spring Onions

6 four-ounce pieces of cubed venison
6 spring onions
½ cup all-purpose flour
3 tablespoons vegetable oil
mustard

Spread mustard lightly over each piece of cubed venison; place whole spring onion in middle and roll. Tie meat with string or fasten with toothpicks. Salt and pepper. Dust roll-ups lightly with flour and brown in oil. Remove and make gravy. Place meat back into gravy and cook on medium heat until meat is tender. Makes 6 servings.

Venison Meat Loaf

2 pounds ground venison
2 eggs
¼ cup sweet pickle relish
¼ cup prepared mustard
¼ cup brown sugar
1 pound pork sausage
¼ cup bread crumbs
1 small onion, minced
¼ cup ketchup
garlic salt, pepper to taste

Combine meats, eggs, crumbs, pickle relish, onion, garlic salt and pepper. Mix thoroughly. Shape into loaf. Bake in oven preheated to 350 degrees about one and one-half hours or until done. Meanwhile, mix mustard, ketchup and brown sugar together until smooth. Spread this mixture over meat during last 15 minutes cooking time. Makes 6 servings.

Venison Pepper Steak

2 pounds venison steak
½ cup butter
1 clove garlic, minced
Dash of powdered ginger
½ cup soy sauce
1 cup beef bouillon
3 green peppers, seeded and sliced in strips
6 spring onions, chopped with tops
Salt and pepper
3-4 tablespoons corn starch
½ cup white wine or water

Cut meat in ½" strips and cook over medium heat in butter with garlic and ginger until well-browned. Add soy sauce and bouillon; cover and simmer until tender. Add green pepper and spring onions and cook only a minute or so. Add corn starch mixed with liquid and stir on a low heat until sauce is clear and thickened. Serve with stir-fried rice. Makes 4 to 6 servings.

Famous Venison Chili

1 - 1½ pounds cubed venison stew meat, fat removed
1 large onion, chopped
1 large bell pepper, seeded and chopped
2 cloves garlic, minced
2-3 tablespoons chili powder
1 tablespoon Worcestershire sauce
1 large bay leaf
Salt and pepper to taste
2 15-ounce cans whole tomatoes
2 8-ounce cans tomato sauce
2 15-ounce cans kidney beans, drained

In a large skillet, sauté the venison cubes in butter or oil until brown. Drain off grease and put in crock pot; add onions, peppers, garlic, tomatoes, beans and seasonings. Mix to combine thoroughly. Cover and cook on low setting for 8-10 hours or on high setting for 4 hours. One hour before serving, taste for seasoning and thickness. Makes about 4 quarts or twelve servings.

Venison Stroganoff

2 pounds venison steak
Flour and salt
Butter
2 cups fresh mushrooms, sliced
1 cup onions, chopped
2 tablespoons butter
2 tablespoons flour
2-3 tablespoons tomato paste
2 cups cold beef stock or broth
1½-2 cups sour cream
3 tablespoons cooking sherry or red wine

Cut venison in ¼" strips and salt and flour. Heat a large heavy skillet. Add butter and place steak strips in skillet and brown quickly on all sides. Add mushrooms and onion and cook 3 to 4 minutes until onion is barely tender. Remove meat and add butter to pan drippings. Blend in flour, tomato paste and beef stock. Stir until it thickens. Return meat to skillet and stir in sour cream and sherry or wine. Heat briefly. Serve over egg noodles or rice. Makes 8 generous servings.

Sausage-Filled Venison Steak or Chops

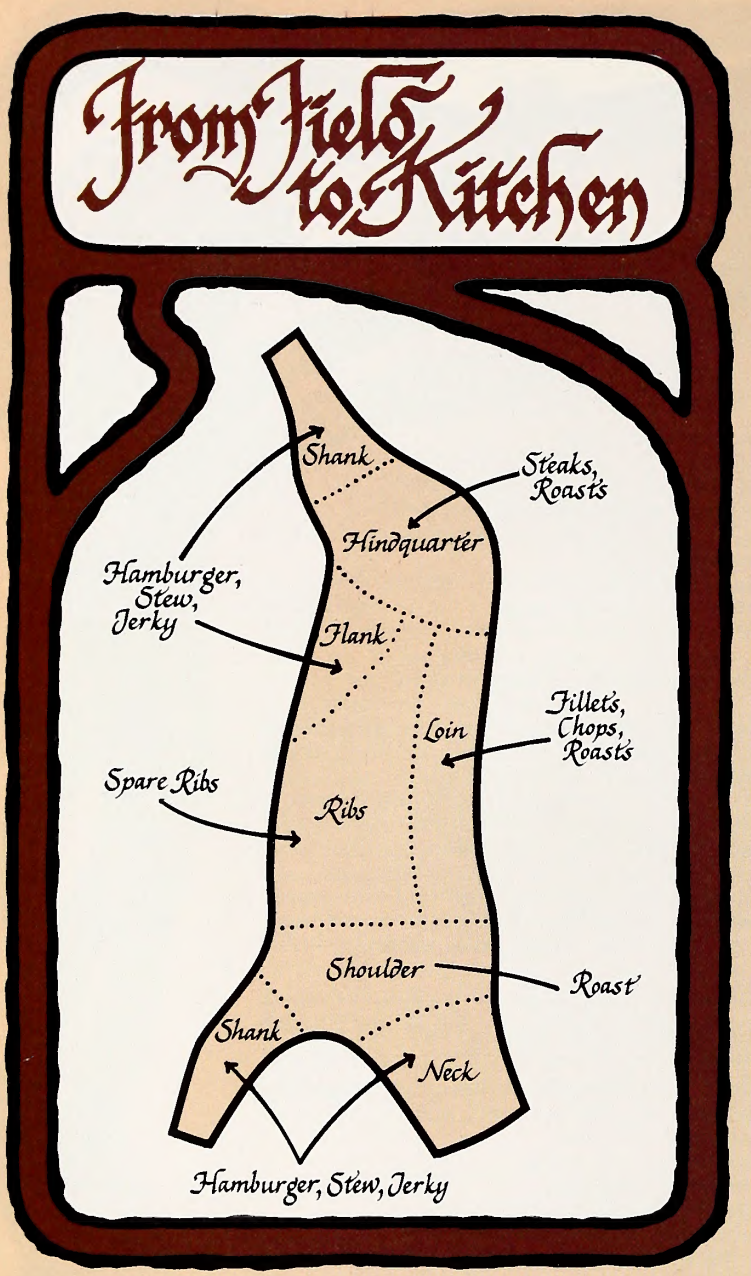
2 venison round steaks, trimmed and pounded
2 tablespoons chopped parsley
2 tablespoons raw rice
½ to 1 cup Burgundy wine
1 pound pork sausage
3 green onions, chopped
1 3-ounce can mushrooms
1 egg, beaten
pepper to taste

Arrange one steak in bottom of greased casserole (1½ quart). Combine sausage, mushrooms, rice, parsley, pepper and egg. Spread half of sausage mixture over steak in casserole. Cover with the second steak. Spread remaining sausage mixture on top. Add wine. Cover and bake at 300 degrees three hours or until meat is tender. Makes 6-8 servings.

If you have never tasted good venison, chances are the meat was not properly cared for before it reached the kitchen. On the next page are tips on how to avoid the most common mistakes that destroy the flavor of wild game.

Calligraphy & Design by Geni Lee Craven

From Field to Kitchen



Many people say they don't like vension because its flavor is "strong" or "gamey." In most cases, I suspect this is simply because the meat was not properly cared for during that period from the time the deer was shot until it reached the table. No meat — beef, pork, chicken or other — will taste good if it is mistreated, half spoiled and improperly butchered.

Unfortunately, while deer hunters may spend years sharpening the skills required to harvest a deer, many neglect to learn even the most rudimentary methods of ensuring that the meat is delivered to the cook in the best possible condition.

There are only a few steps in the proper care of venison, all of which are easily mastered. Indeed there is really no excuse for bad venison to reach the table.

Probably the most common mishandling of venison occurs immediately after the deer is killed. What is, or isn't, done at that time will have a great effect on the quality of the venison. It is most important that the deer be field dressed as quickly as possible. By field dressing, I mean the removal of the internal organs. The procedure is relatively simple, but if you don't know how, get an experienced deer hunter to show you the technique or review the article on this subject which appeared in the December 1976 issue of *Wildlife In North Carolina* (your local library should have an issue if you have misplaced yours, and there are many other books which contain this information). Field dressing allows body heat to dissipate rapidly and removes blood that would otherwise settle in the meat and affect the flavor. With the warm temperatures that are often prevalent during the early portion of the season, and even some of the later season, it takes only a short time for the meat to spoil.

Deer, or any other big game, should be handled basically like cattle or pigs that are killed for the table. I've never known anyone who killed a steer or pig and let it lie around for two or three hours before dressing it out, but I've run across more than a few deer hunters who will do exactly that.

If you field dress your deer in the woods, take care not to get dirt or trash in the body cavity while bringing the carcass out. Some hunters carry a stout nylon string to sew the body cavity shut after field dressing. If you're by yourself and have to drag your deer to your vehicle or camp, avoid rocks or stumps that might bruise the meat.

Once you get to your vehicle, load your deer on the roof, trunk deck or on the rear bed of a pickup for the trip back to camp or home. Avoid, at all costs, placing the animal on the engine hood because the engine heat will hasten spoilage. The same can be said for transporting your deer carcass long distances in the trunk of a car, or the forward portion of a pickup truck bed. In both places, it can pick up heat from the exhaust system.

Once you get your deer home, it should be skinned and the carcass allowed to age. Aging is a very important step if you want to obtain the best possible tenderness and flavor for your venison. Some people think that a carcass that's left lying around in a field, in the back of a truck, or on the back porch for a few days has been properly aged. Actually, it's more likely that such treatment results in the meat spoiling, and there's a significant difference between spoiling and aging.

To properly age meat, it must be hung at a certain temperature for a certain period of time. The experts recommend that meat, including venison, be aged at a temperature of 35 to 40 degrees, and the length of time will depend upon the deer. For a very young deer, three or four days should be plenty of time. For a mature deer, 10 to 14 days is generally recommended, and if your trophy is a grizzled old buck, up to 21 days may be advisable.

After aging, all that's left is to cut and package your deer. Many hunters prefer to employ the services of a local butcher for this job. In communities where a considerable number of deer are taken each year, one or more butchers and commercial freezer lockers will often specialize in handling and processing deer. Call around to locate one in your area. Their fees are usually reasonable.

You may prefer to butcher your own venison carcass, and there's really no reason you shouldn't. Refer to a standard butcher chart, such as the one above, and cut your steaks, chops and roasts just the way you want them. Always endeavor to cut across the grain, and remove all fat and membranes from your cuts. Venison fat turns rancid rapidly and can ruin otherwise excellent cuts.

For storage in your freezer, best results are usually obtained by first wrapping the cuts in waxed paper and then wrapping them again with freezer paper or aluminum foil with airtight folds.

written and photographed by Louise Coleman

Riding To Hounds

The blessing of the hounds and the colorful attire of the horsemen signal opening day of one of the oldest and most traditional sporting events in North Carolina.

As I sat on the hillside waiting for the hounds and the "hunt field" to make their appearance, I couldn't help but feel that I was standing somewhere on the British countryside, perhaps in another time. Against the backdrop of a foggy, gray day, a group of horsemen attired in either scarlet or black riding coats and sitting astride well-mannered thoroughbred hunters was slowly making its way towards the onlookers. Leading the procession was a pack of well-controlled foxhounds, their noses glued to the ground while tails wagged furiously. I felt a twinge of excitement as I recalled my own foxhunting experiences in Virginia; but as I looked around me, I wondered if people really understood what makes "riding to hounds" such a popular sporting event in America today.

Fall and winter usually bring to mind such events as football, basketball, ice hockey and skiing; but if you are a horseman, November signals the start of one of the oldest and most traditional sporting events in this country — fox hunting.

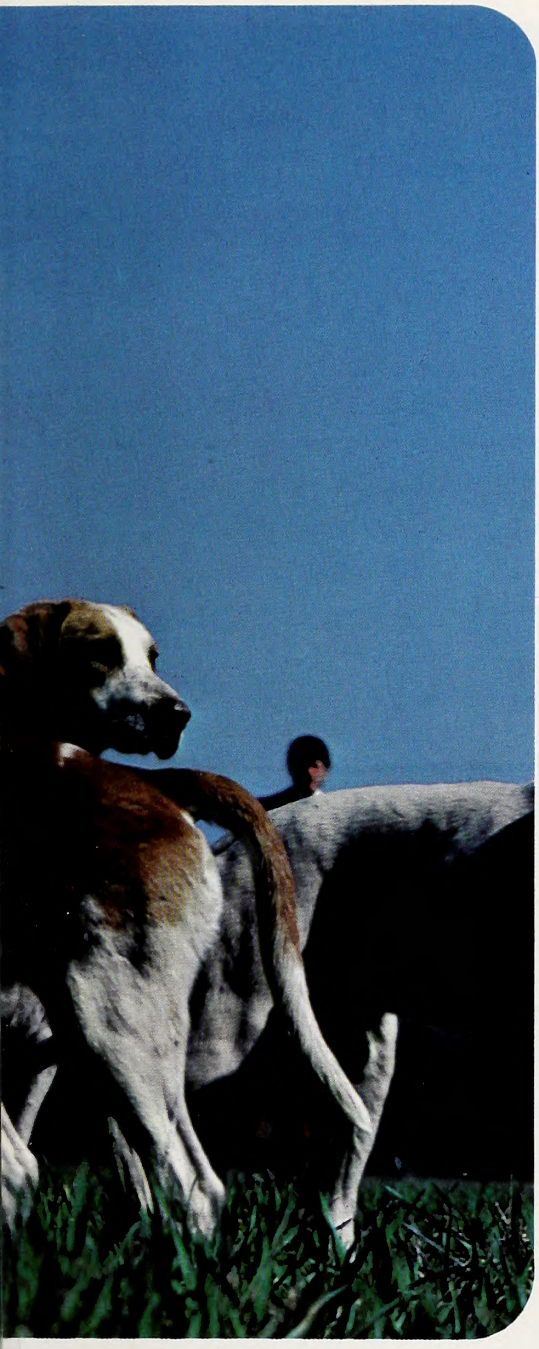
Last year, I was among the hundreds of spectators who traveled to Southern Pines to watch the opening day meet of the Moore County Hounds, one of the

oldest and most famous packs in America today. Every year registered packs across the country hold their opening day meet on Thanksgiving Day; and in many areas like Moore County, people get an opportunity to enjoy the rich color and pageantry associated with the event.

Fox hunting, sometimes referred to as the "sport of chase," found its roots in Europe in the sixth century; and by the eighteenth century, the sport had become extremely popular in France and England. During the eighth century, religion aligned itself with hunting as St. Hubertus became the Christian patron saint of all hunters. The religious connection is still in evidence today as the tradition of "blessing of the hounds" is performed by a minister on the opening day to ensure the hunters and hounds a safe season.

In 1960, the first organized British fox hunting pack was formed, and the cry of hounds was soon heard throughout the forests and fields of the American colonies. George Washington was among the early enthusiasts of the sport in this country, recording in his diary almost 200 accounts of the individual hunts in which he participated. The first organized American hunt pack, formed in 1766 by 27 Philadelphia gentlemen, was called the Gloucester Fox Hunting Club. Today, there are approximately 130 registered packs in America that are governed by the Master of Foxhounds Association. In North Carolina, there are five registered packs: Moore County Hounds (Southern Pines area), Triangle Hunt (Raleigh area), Sedgefield Hunt (Greensboro area), Tryon Hunt Tryon area) and the Yadkin Valley Hunt (Winston-Salem area).

"Riding to hounds" requires good horsemanship,



Excellent body symmetry and a keen hunting sense are noted characteristics of the English foxhounds (above left) owned by the Triangle Hunt Pack of Raleigh. Thomas Wright (above right), Joint Master of the Triangle Hunt Pack, is in constant communication with the hounds, either with his voice or the traditional horn. A succession of short blasts is used to get the pack together; the cry of "tally ho" announces that a fox is in sight. Another essential piece of equipment is the dual-purpose whip (near right). When cracked by the whipper-in, it helps keep hounds from straying from the pack, and the whalebone crook on the handle is a handy device for opening gates.

Steve Maslowski

On the opening day meet of the Moore County Hounds of Southern Pines, Joint Master and Huntsman Virginia Moss (above) leads the hunt staff, field and hounds in one of the State's more popular and colorful sporting events. Moss, who has held her rank for over 30 years, is known as one of the few women who is both Master of Foxhounds and Huntsman. She both owns and works the hounds, sharing the responsibilities of heading the hunt club with Joint Master Richard Webb (above right). Although the red fox is an English import, the gray fox species is native to the South, and particularly North Carolina where the sly creature is never above darting into a swamp and doubling back on his trail to foil his line of scent.

sportsmanship and an understanding of nature. It is also the sport of the chase which excites most hunters, not the kill. In fact, it is rare nowadays for a fox to be caught.

To appreciate the pageantry of the sport, it is necessary to understand the technical side. A group of fox hunters is divided into two sections, the hunt staff and the "field" (hunt members). Hunt staff members head the group and are easily recognized by their scarlet coats ("pink" is the correct term if you're a hunter) and velvet hunting caps. The field wears black coats and derbies. If you look closely, some members may be wearing the official color of the hunt on the lapels of their coats. A member earns his "colors" by hunting regularly for a minimum of three seasons.

The hunt staff consists of the following people: Master of Foxhounds (M. F. H.), huntsman, whippers-in and a field master. The master, or joint master if there are two people, is head of the entire hunt organization. He not only appoints his hunt staff, but assumes much of the financial responsibility of maintaining a pack. A Master of Foxhounds may either hunt his own hounds or appoint a huntsman for this duty.

The huntsman is the second most important person of the staff for he's totally in charge of hunting the hounds. This person must be knowledgeable about hounds and foxes, and he must thoroughly understand the hunt country in terms of geography and scenting conditions. He is in constant communication with his hounds either through use of his horn (he is the only person in the field that carries one) or voice. A huntsman must know the foxes just about as well as the hounds since the same fox may play the game of chase from one season to the next. Some foxes are even given nicknames!

All huntsmen are supported by whippers-in, also known as whips. Usually there are two to three whips in a field, and they may either be professional or amateur. The term "whips" comes from the fact that these people carry a whip which is used in controlling the hounds; however, the whips are never used on a dog. The loud noise they produce when cracked in the air quickly urges a wandering hound to return "home" to the pack and huntsman. The last member of the staff, the field master, has the job of controlling the field, not always an easy job when you consider a field may number anywhere from 20 to sometimes a 100 people (opening day usually results in large turnouts).

The field master enforces the rules of the sport. For example, the field may never cross the scent of the fox, or "line" as it is called, and it must never interfere with the hounds or hunt staff. There are two other important members of the hunt pack organization that are not members of the staff. The kennelman is responsible for the care of the hounds, and the hunt secretary is in charge of billing, scheduling of meets, and sending out schedules known as "fixtures." Public relations is also part of the job since the secretary must maintain good relations with landowners whose land is part of the hunt country.

Hunting is a very technical sport both in language and equipment. All equipment has a functional purpose. The most common object brought to mind in

fox hunting is the horn. The modern day hunting horn is straight and measures nine to twelve inches in length. The mouthpiece is made of silver or a combination of gold and silver, while the horn itself is copperplated. It provides a means for the huntsman to "talk" with his hounds. The whips have a dual purpose. A right-angled crook (usually made of whalebone) on the handle is a handy device for opening and closing farm gates, lowering rails on a fence, or moving small logs out of the way of a hunt jump. Whippers-in also wear a leather strap across their chest which is given to anyone in the field who breaks a stirrup strap.

The essential ingredient in any fox hunt is the pack of hounds, and of course, the fox. In general terms, foxhounds used in this country are of the American or English variety. The American foxhound, of which there are several types, is a bit sleeker and tends to give more tongue than his English cousin. Ten to 20 hound couples (you always refer to pack's size in terms of couples, meaning two) are used on a hunt. A good hound is one which can be controlled by the huntsman and demonstrates teamwork capability. Above all, a hound must have determination, stamina and a good nose to follow the line of the fox.

A fox hunt is begun when the huntsman "casts" the hounds, which means working the pack in an area that may be the hangout of a fox. If the hounds pick up the scent, they immediately give full tongue and start running the line (following the scent). One of the most unusual aspects of hunting is that the hound always seems to know which direction the fox is moving. If a pack comes across the middle of a line that is three or four hours old, it will rarely backtrack.

The game of chase requires two parties, the hound and the quarry, and in this case, the quarry is either a red or gray fox. The gray is indigenous to this country, while the red was imported from England during colonial days. Many experts will tell you that the red fox tends to give the hounds a more sporting chase, while the gray can sometimes be a sour sport, simply climbing a tree if he's bored with the game.

Formal hunting season (formal means that hunters must always wear the proper dress) usually starts somewhere in October or November. Hunt packs in the northern regions tend to start earlier and stop earlier because of the weather. In the South, the season ends in the early spring as this is the time when vixens (female foxes) are about to whelp their litters. Many hunters will go "cubbing" during late summer and early fall; "cubbing" refers to the training of young hounds. Huntsmen try to "blood" their young hounds at least once in their life so that they understand what hunting is all about. To blood a hound means the hound has killed a quarry; and in this case, it is almost always a sick or wounded cub that is about to die anyway. During the hunt season, the pack hunts three times a week. Following each hunt, members will usually sit down to a hale and hearty hunt breakfast and discuss the day's hunt.

A traditional and favorite type of hunting in North Carolina, fox hunting is very hard to describe in words. The colorful pageantry of the chase and the deep-throated sounds of the hounds echoing throughout the countryside are as essential to the hunt as the scent of the fox and the traditional blessing of the hounds. Oftentimes, it is just as much a sport for the quarry as for the hunter. But, even more often, it is the fox who is the winner, sending both the hunter and the quarry home at the end of the day with a good feeling from the sport of the chase.

Louise Coleman is a free-lance writer from Raleigh with an active interest in fox hunting and hounds. A past fox hunter, she now maintains her contact with the sport through raising beagles and photographing area hunts.

Honoring the line of scent and riding to the hounds, the staff of the Triangle Hunt Pack takes off in hot pursuit of the wily gray fox.

Letters

Dear Sir:

As a longtime subscriber of *Wildlife in North Carolina*, I, like many others, compliment you on the most attractive and most interesting magazine I have ever read. There are so many beautiful pictures and I especially enjoyed the September issue because of the article on trees.

I want to tell you about a red oak in our yard. It was a good sized tree when we bought our place over 43 years ago. Now, it measures 146 inches in circumference, branches out 100 feet, and is about 130 feet tall. It really is a beautiful tree.

Mrs. James Barbee
Maysville

Those who want to report a tree that they believe might be a record should write to Big Tree Search, Division of Forest Resources, P.O. Box 27687, Raleigh, N.C. 27611.

Dear Sir:

I have just read "It's The Law" in the September issue of *Wildlife In North Carolina*. I paid special attention to "HB-603" which prohibits the taking of female deer in Martin County.

Although I live in Bertie County, I do hunt a little in Martin County. The population of deer along the Roanoke River, above and below Hamilton, certainly should allow the taking of doe.

Farmers in this area are already shooting them in spring and summer for destruction of crops. But, some of these farmers still won't let deer hunters hunt their land.

It seems to me that it is better to legally harvest does and use them for food rather than shoot them in spring and summer and let them rot in the woods and fields.

I really enjoy your magazine very much, so keep up the good work.

Franklin Lee
Merry Hill

Dear Sir,

I was thumbing through your October issue and was disappointed that you had not identified the grouse hunters who were taking the noonday lunch break. The hunters are Bob Senior, with the German shorthair pointer, and his brother-in-law Edd France from Ohio. I know your readers in Graham County would want to know that some "home folks" had appeared in *Wildlife In North Carolina*. My husband and I love to read the magazine.

Mrs. Wilson Blankenship
Robbinsville

Dear Sir:

I enjoyed the article on RARE II in the October issue. I think it is a program that definitely needs explaining to clear up the misunderstandings that currently surround it. RARE II is a sound, logical step toward preservation of a portion of what little wilderness we have left. Without a program of this nature, I doubt if 10 years from now we would have any forest land left that had not been adversely affected in some way by motorized equipment. With all due respect to ORV owners and Detroit car makers, I am of the firm opinion that off the road vehicles or four-wheel drive trucks (call them what you want) are one of the biggest despoilers of the forest ever invented. Oh, how I yearn for the day that I can fish without hearing the angry whine of a motorcycle or truck cutting through a trail that used to be for walking only. Believe me it happens.

North Carolina is behind other states in its efforts to keep its forest lands out of the hands of greedy developers and others intent on sucking the land dry. We need RARE II — every bit of it and then some. Let's not let overzealous special interests and other misguided souls bring a program as important to all of us as this is to its knees. Support RARE II.

Charles H. Ott
Greensboro

Dear Sir:

We were very pleased with Mark Taylor's article on the Eno and our Association in the August issue of *Wildlife in North Carolina*. I'm sure you know that we try very hard to keep the Eno and its needs in the public eye. It's easy for people, including our own members, to become complacent about what has already been achieved and to forget that the river is still not safe from a number of threats. We especially appreciated the article's emphasis on the ongoing need for vigilance and public involvement in protecting it.

Please accept a warm "thank you" from our Board of Directors for all you've done to help the Eno.

Sandy Williams, president
Association for the
Preservation of
Eno River Valley
Hillsborough

Dear Sir:

I can't believe the view of *Wildlife in North Carolina* in your article on Albemarle Sound stripers (October 1979).

Let me start by saying I am not a commerical fisherman nor an avid sport fisherman, although I used to fish for rock as well as white perch in Albemarle Sound years ago.

I think the major reason for the decline in fish, not only stripers but all species in Albemarle Sound, is pollution — a word which you seem to avoid in your article.

With two major plants — pulp mill and fertilizer — both dumping in the sound, I see no way which pollution can be prevented. And with the amount of money which these companies spend here, I don't think anyone wants to say much about this problem.

In your article, you state fish may have reached a peak in the late 1960s. I well remember when I was younger that stripers would school in the sound for many weeks. There was also good fishing for pan fish like perch, croakers and the other small fish. Now, even these have all but vanished, and hardly even a shad is caught.

As for the rising prices in rock or stripers, there is only one reason; low supply and high demand. Also, the wholesale market pays more per pound for large stripers than small ones here.

I don't think we have to worry about the price of fish being a problem, but the lack of fish. Flood the market and prices drop as demand decreases. The lack of fish has caused the high prices.

I don't know much about the study on eggs or breeding of fish, but I know dead fish when they float belly-up in mid-summer at a time when fishing once was best. I know something has to kill these fish, and it isn't commercial fishermen or sports fishermen.

White perch turn red as blood, as if bleeding through the skin. Croakers and others are all but completely gone.

Croatan Sound still has good fishing year round, both commercial and sports fishing. There seems to be no problem there yet. But if the people of Dare County sit around as we have here, that bad water is on its way there. Soon, the same problem will exist there.

I think someone in the State needs to do something about this problem to prevent future problems, even if nothing can be done about it now.

As for your article, I think you left us with a lot of blanks to fill in and a curve around the real problem.

Elmo Hassell
Columbia

Dear Mr. Hassell:

We agree with you that pollution in Albemarle Sound is a problem, and it's one we all hope can be controlled. The article you mentioned primarily discussed a study concerning problems with striper reproduction and we hope you saw our follow-up article in the November issue which talked more specifically about the pollution in this area. Thanks for writing.

Back of the Book

Jack Dermid

Hurricane David deposited many unusual species of terns, similar to these royal terns, along North Carolina's coastline in September. Sea birds are often pushed far out of their normal ranges by hurricanes, or are carried along in the storm's eye for long distances. David dropped one group of sooty terns in Massachusetts, a species usually found only in tropical waters.

Unusual Sea Birds Sighted Following Hurricane

The threat of Hurricane David in September may have had coastal dwellers worried, but bird watchers were ecstatic. They expected to see all sorts of strange birds driven into North Carolina by the storm, and they weren't disappointed.

"Hurricane David deposited the largest number of unusual birds seen the State in about 10 years," said David Lee, an ornithologist with the N. C. Museum of Natural History who records sightings.

According to Lee, there were a number of rare sightings made following the storm. Two species of sea birds called tropic birds were reported in Wake County. These birds usually live only on the open ocean in regions of the Atlantic stretching from the Caribbean to Africa.

"It's very unusual to see tropic birds, even when you are actively searching for them," said Lee. "These strange ocean birds spend most of their lives soaring far out to sea feeding on fish and other life they find on the surface of the water."

Sooty and bridal terns were also sighted along the North Carolina coast. These birds live offshore in the Gulf Stream, and are only sighted inland during storms. Knotty terns were the most unusual species sighted. These birds have never been reported in North Carolina; and for one of these species, it was the first sighting in North America. These terns also live in the Caribbean and tropics.

"Knotty terns and some other sea birds can apparently fly for months or possibly even years at a time," said Lee. "No one has ever seen a knotty tern resting on the water. The birds were apparently driven north by the storm and couldn't feed because of heavy seas. These birds can also find their way back home over incredible distances. People have taken knotty terns to England, banded them, and released them only to find that the birds returned to their original capture sites in the Caribbean in a couple of weeks."

Storms influence sea birds in a number of ways. As a front moves, the birds will gather in front of it trying to stay out of its path. If they swing around to the seaward side of the storm, they will be safe. If they are caught between the sea and the land, the birds will try to fight their way into the storm, since their instincts tell them to stay over the open sea. When these birds are driven ashore, they take cover on land and are often weak or dying. Sea birds are also sometimes caught in the quiet eye of a hurricane and can't get out. These birds will travel with the storm until it passes over land, and then take cover on the ground. Ships that have entered the eyes of hurricanes have reported being covered with thousands of weary sea birds within a matter of minutes.

"We've been studying sea birds extensively for the last four years and have found that there are some living off our coast that were previously thought only to live in the Antarctic," said Lee. "The Gulf Stream makes our waters incredibly rich, which accounts for the abundance of bird life and the excellent offshore fishing. We're also on the edge of the range of northern birds and tropical birds, giving us a lot of species diversity. We have documentation that we have the richest offshore bird life in the Atlantic Ocean north of the equator."

Duck Stamp Funds Badly Needed

Waterfowl lovers probably noticed that the price of the Migratory Bird Hunting and Conservation Stamp, popularly known as the duck stamp, increased from $5 to $7.50 last year. The price hike was made by the Department of the Interior to offset the rising costs of habitat acquisition.

Since the stamp was created in 1934, over 75 million have been sold. This has provided over $210 million in revenue used to purchase over 2.3 million acres of habitat. Each year more than 2.4 million duck stamps are sold to waterfowl hunters, conservationists and stamp collectors.

The price increase is expected to yield about $5 million in additional revenue annually, which will be used by the U. S. Fish and Wildlife Service to purchase waterfowl habitat in the United States. This program is vitally important since over 300,000 acres of wetlands are lost annually in this nation to development.

Christmas Tree Trivia

Over 40 million Christmas trees will be gracing American homes over the holidays. For you Christmas and Christmas tree buffs, here's some trivia on holiday greenery that you may or may not know.

— The use of evergreens as a religious symbol is almost as old as written history. Families celebrated a Christmas celebration of sorts during the winter solstice long before Christ was born, and evergreens were considered a symbol of life in these ancient religions. People decorated their homes with greenery, lit bonfires, danced, and performed religious ceremonies to entice the sun to warm the earth again.

— The first Christmas tree shortage occurred in New York City in 1907. Dealers were short 68,000 trees and the city went into a tizzy. Newspapers editorialized that only families with children should buy trees, and people should use artificial trees if possible.

— Teddy Roosevelt didn't want a Christmas tree in the White House in his first year in office. When reporters asked why, he said he wished to bring public attention to the destruction of our forests. One of his distant relatives also struck a blow for conservation via the Christmas tree a few decades later. President Franklin D. Roosevelt planted the first Christmas tree plantation on his Hyde Park estate on Long Island and urged other farmers to do the same. He wanted people to buy Christmas trees instead of cutting trees from the roadsides.

— About one million Christmas trees worth five million dollars will be harvested from North Carolina plantations this year. Sixty percent of the trees will be sold out of state, mostly in the Southeast and Midwest.

— Your Christmas tree can still be useful after Christmas. If you place the tree in your backyard and string it with suet, it will offer food and shelter to songbirds. Brush piles made of discarded Christmas trees also offer good cover for many wildlife species, and a weighted tree makes a fine hurdle (fish attractor) in a lake or pond.

Win Some, Lose Some On Environmental Bills

A number of environmental bills were acted upon by the State Legislature during its last session. Here's a rundown on a few of the bills that were passed or killed as reported in the Conservation Council of North Carolina's recent legislative summary.

Several bills that were passed deal with water pollution. One measure will ensure that State water and air pollution regulations are in line with federal standards. An amendment was also added to the existing oil pollution control act to include hazardous substances in the regulation, and the State will be allowed to collect costs from spills to repair damage to natural resources. Another law will provide stiffer penalties for the improper disposal of toxic and hazardous wastes, including PCBs, kepones and certain designated heavy metals.

Several other changes were also made dealing with water and air pollution. A State agency will not be allowed to adopt stronger guidelines on air quality and hazardous waste disposal than existing federal guidelines. The State Environmental Management Commission will have to consider cleanup costs to polluters when enforcing water pollution control measures. A new bill will also provide a lengthy process of appeals from local erosion-control orders. An amendment prohibits applying special cleanup orders to agricultural operations.

Several measures were also passed dealing with the storage of nuclear and hazardous wastes. A county public hearing is now required before a processing and disposal facility for radioactive or hazardous wastes can be licensed, and North Carolina will not accept any radioactive waste for permanent storage that was not used in producing electricity for the State. However, electric companies can get around the new law by calling their waste "spent fuel" instead of radioactive material.

Several new bills were also passed dealing with energy. Two new tax credits will promote the use of alternative energy sources. One will encourage industries to convert to wood for fuel, and the other will encourage industries to use waste heat from their operations to generate electricity. A bill expanding the solar tax credit to include passive solar heating systems also passed the House and will be considered in the Senate's upcoming session.

An endangered plants bill was also passed; however, this has little or no true impact because these plants will receive no protection if they interfere with agriculture, forestry or development of any kind.

For more information on environmental legislation, write Conservation Council of North Carolina, 307 Granville Road, Chapel Hill, N.C. 27514.

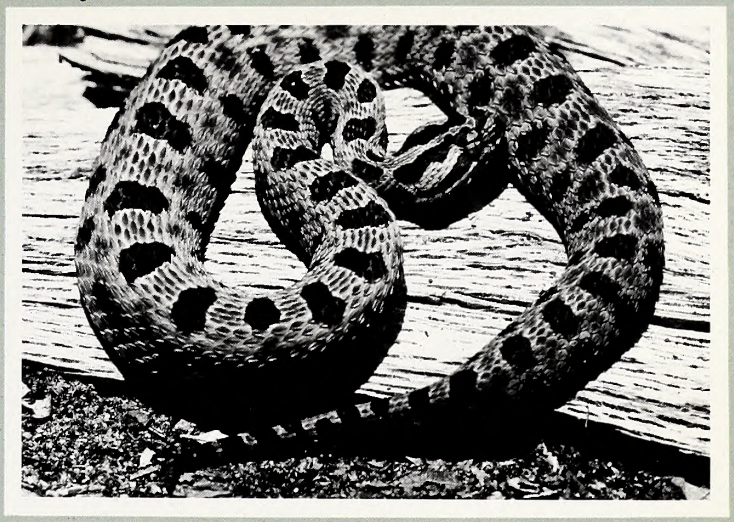
Forest Service Firewood

National forests in western North Carolina furnished over 5,000 cords of firewood last year to homeowners. Forest Service officials say there has been a dramatic increase in requests for firewood permits, and the Pisgah National Forest has become one of the leading sources of firewood in western North Carolina. Foresters feel the demand will continue to grow in the future.

Individuals are allowed to take two cords of "down wood" per family after they get the appropriate permit. This works out to about four pickup truck loads of wood. Standing green timber is also available at a minimum charge of $10 for two cords, with additional cords costing $5. The modest fees for the wood offset the cost of running the program. Standing timber cut for firewood is usually removed from areas which need a thinning or precommercial cut to improve the overall stand.

Firewood cutting on National Forests is generally allowed from September 1 through December 15. For more information, contact National Forests In North Carolina, P. O. Box 2750, Asheville, N.C. 28802 or call 704-253-2352.

Joel Arrington



Contrary to popular opinion, the rattlesnakes do not rattle to signal an intention to attack but to give a warning. If the threat is removed, the snake will go about its business. Many other snakes also "rattle" their tails in dry leaves when threatened in imitation of the rattlesnake.

Riddles Of Animal Behavior

Anyone interested in wildlife will be fascinated by a recent issue of *International Wildlife* dealing with animal behavior. Here are a few examples of animal behavior that may interest Tar Heel wildlife lovers.

Why do geese mate for life? The habit has less to do with "true love" than with necessity. Time is short following the extensive migrations geese make to their arctic summering grounds. If courtship rituals were necessary once the birds arrived, little time would be left for successful nesting. Therefore, in the interest of saving time, geese form permanent bonds and many prenesting rituals are performed before, or during, migrations.

Why do raccoons wash their food? They don't. They simply sift through the sediment in streams and ponds looking for dinner, making it appear as if they are washing their food.

Do animals play? The answer is yes. Adult polar bears have been observed trying to balance stones on their heads, which can serve no worthwhile purpose except for having a good time. However, play among most animals, as in humans, "socializes" the animals and hones survival skills needed later in life.

Why do wolves howl? For a variety of reasons. Wolf packs hunt over large territories at night, and howling allows individual animals to keep track of each other. Neighboring packs can also keep track of each other and keep their distance if the territory is getting too crowded.

Why do rattlesnakes rattle? It's a warning sign and does not signal an immediate intention to strike. If the threat is removed following the rattle, the snake will go about its business. If the threat remains, it will prepare to attack. Some scientists feel the practice evolved in ancient times in prairie rattlers which lived around large herds of sharp-hooved animals that trampled them on a regular basis. Rattlesnakes also aren't the only snakes that emit a warning rattle. Many snakes, including black snakes and copperheads, will rattle their tails against dry leaves to warn intruders to keep their distance.

Why do fireflies flash? It's a signal used in their mating rituals. Male fireflies seeking a mate will emit a series of flashes in a precise code. If a female answers in the same code, the insects will mate. However, life is never simple, even for a firefly. There is one particular species that plays dirty pool. The female will imitate the flashing pattern produced by a male of a different species. She then lures the dashing young bachelor off to a secluded place with lurid promises and proceeds to gobble him up.

Wood Fuel Use Growing

It appears that Americans are "throwing another log on the fire" in unprecedented numbers these days. The U. S. Department of Energy has found that wood now provides Americans with half as much energy as nuclear power.

The woodburning craze got into full swing following the Arab oil embargo of 1973-74. Between 1972 and 1977, the number of woodburning stoves in use has increased from 250,000 to over two million. In some areas, wood has become a primary source of heat. One-fifth of the homes in northern New England use wood as the primary heat source, while another 30 percent use it as a supplemental heat source.

The use of wood stoves has also increased dramatically in North Carolina, and many industries have turned to wood as a source of energy. There are currently plans underway to convert several state facilities from fossil fuel to woodburning systems.

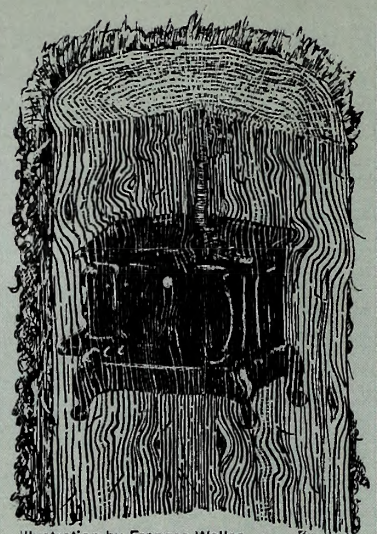


Illustration by Frances Welles

Urban Falcons Doing Fine

Four endangered peregrine falcons are thriving in a most unusual setting. The birds grew up and have learned to fly from atop the Department of the Interior Building in Washington, D. C.

Scientists decided to try to raise the birds in an urban setting to offset the high mortality of peregrines released in the wild where they often fall victim to great horned owls and other predators. The city-bred falcons appear to be thriving on Washington's ample supply of pigeons.

Joggers A Brave Bunch

It's a jungle out there. Nobody knows this better than joggers at the University of Florida at Gainesville.

It seems that alligators in the Gainesville area have made quite a comeback and are becoming somewhat of a problem. Part of the campus jogging trail passes through a swampy area, and some joggers are hearing the click of closing jaws as they pass through the swamp. While no one has been chomped yet, the gators are taking an occasional snap at the passing bait. University officials are using cattle prods to shock the offending animals and keep them away from the jogging path. If the prods fail to work, part of the swamp may have to be fenced to keep gators and joggers in their native habitats.

August Enforcement Report

For the month of August, 1979, the N.C. Wildlife Resources Commission checked a total of 17,476 hunters and fishermen and 8,921 boaters.

Of the hunters and fishermen, 880 were prosecuted and 788 convictions were obtained. The total fines collected were $6,101 and the total costs collected were $17,718.

Of the boaters checked, 728 prosecutions were made and 670 convictions were obtained. Total fines collected were $1,251 and total costs collected were $15,990.

Other prosecutions totaled 34 and convictions totaled 31. Total fines collected were $485 and total costs were $810.

All fines and any arrests or witness fees are paid into the school funds of the counties in which the violation occurred, and no fines or costs are paid to the N.C. Wildlife Resources Commission or its personnel.

Nature Film Available

A film entitled "A Closer Look," is now available from the Sierra Club for a small postage fee. "A Closer Look" deals with environmental relations and plant succession.

The film is based on the book by Michael Godfrey of Durham. Godfrey has written extensively for nature magazines, including *Wildlife In North Carolina*.

According to Peter Hawkins, the producer of the film, the movie deals with environmental relations and plant succession as a freshly mowed field matures into a full-grown hardwood forest. Much of the film was photographed near the Eno River in Durham. The film received a CINE award, and was a finalist in the Black Orca Film Festival in Seattle, Washington.

Anyone interested in obtaining a copy of the film should contact Laurence Dawson, Sierra Club Films, 44 Montgomery Street, San Francisco, California 94104.

Bobcats And Otters Needed

Biologists with the N.C. Wildlife Resources Commission need bobcat and otter carcasses for a furbearer study, and are asking trappers and fur dealers to help by providing carcasses to the Commission after the fur has been removed. The Commission is not interested in obtaining the fur, but the head and entrails should remain intact.

Biologists hope to learn more about reproductive rates, ages, sex ratios and food habits by examining the teeth, reproductive tracts and stomachs.

Biologists will pack up the carcasses (fresh or preferably frozen) when contacted by trappers or fur dealers. Researchers especially need bobcats trapped in the Piedmont and Mountains.

To learn the name of the biologist in your area, write to the N.C. Wildlife Resources Commission, Archdale Building, Raleigh, N.C. 27611 or call the Commission's toll free hotline 1-800-662-7137.

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Nature's Ways

Should You Feed The Birds?

written and illustrated by Duane Raver

Snow has covered the ground; a sharp wind swirls the white flakes against the brown leaves and the temperature is hovering around the 20 degree mark. We all know that wildlife is suffering and needs "feeding," right? Yet, even if winter wildlife desperately needed food because of prolonged bad weather, the task of providing enough food artificially would be little short of impossible.

Artificial feeding of our wildlife populations is seldom necessary and is not often practiced by fish and game agencies over the country. The stories that make the headlines are often accounts of dropping hay and other food to the starving elk and deer in the snowed-in mountains. Such operations are very expensive, last resort measures designed to provide relief to pockets of isolated animals.

Nature provides winter wildlife species with heavy coats which insulate them from freezing temperatures, as well as a bit of extra reserve fat for the "lean" times. Most birds and animals have the ability to make it through several days with practically no food at all. The ones that don't make it are usually those animals already weakened by disease or old age. Additional feed might prolong their lives only a short while at best.

From this standpoint, nature's way seems cruel and unforgiving. Yet, if all the deer, quail, doves and other wildlife in a given area survived the winter, the carry-over population would be too great to subsist on next spring and summer's food supplies. Serious damage to the habitat could occur and farm crops might suffer even more than they do now from "excess" wildlife. Thus, it is entirely natural that wild populations are reduced during the fall and winter to balance the numbers with available food. Hunters fulfill a role as predator in this removal of the excess, and are far less wasteful of the resource than starvation or other mortality.

The temptation to "feed the birds" is a strong one, and it likely does neither much harm nor any substantial good. Perhaps winter bird feeding does those of us who keep the feeder filled more good than it does the birds (and squirrels) who clean them out. We can certainly enjoy the birds at closer range this way, and this can be a learning experience. But once we start it, the feeders should be kept filled because species become unnaturally dependent upon it.

Migration is one device nature uses to minimize winter food problems for some wildlife. It's usually not the cold that drives the waterfowl south or urges the songbirds on long flights, but rather the disappearance of food for those species. Hibernation or "winter naps" (see "Nature's Ways," February 1979) also help a few of winter's wildlife individuals. But for most, the only alternative is to try to enter the cold season in good shape, adapt to those food items which are available and hope for an early spring. The season for us to truly help winter wildlife is long past. Food-producing plants should have been planted late last winter or spring, and these would have provided far better than any artificial feeding now.

Feed the birds? Many of us do and will continue to do so — but that's really not nature's way.

Fox On The Run

This gray fox may have given the hounds the slip, but that's not unusual. In fox hunting, it's the chase and not the capture that is most important.

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